



University of Wales
Trinity Saint David



Advancing Management Excellence

A STUDY OF INTENTION FACTORS OF ONLINE HIGHER EDUCATION IN HONG KONG

A Dissertation submitted to The University of Wales for the
Master of Business Administration (MBA)

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ABSTRACT

Since the COVID-19 pandemic, many students worldwide have been forced to use apps such as Zoom to maintain essential learning due to lockdowns and school closures. Nowadays, many people find that this teaching mode moves the classroom to the internet, completely ignoring other crucial elements in the school, which seriously affects students' concentration and interest in learning. After a whole year of "online teaching and learning mode", learners feel that it is monotonous and lacks interaction, and they start to lack motivation for online learning. But online teaching is not new. Many studies point out that online learning environments can provide learners with opportunities for flexibility, interaction, and collaboration that are distinct from face-to-face learning environments. However, integrating online education technology in the local higher education industry has also brought challenges and concerns to student learning.

And online learning platforms provide interactive learning, additional teaching tools and other educational technologies, all of which can help educators use technology to make up for the shortcomings of online teaching like traditional classrooms. However, why has online education technology been developed for many years and only become famous under the epidemic? Will students be eager to return to school, return to classrooms, and communicate directly with teachers and classmates? So, is online education just a substitute for the teaching model under the epidemic, or is it entering a golden age of development?

This study attempts to understand and determine what factors can affect students' motivation for online learning through the four aspects of Social Presence, Personal Experience, Digital Divide and Learning Outcomes. This study uses scholarly literature to understand which factors in past research affect learning intention and explores the determination and application of each element. Then use the questionnaire form to collect data, conduct research hypotheses, research methods, research structure and design, and make a questionnaire pre-test. Then use SPSS software for data analysis; descriptive statistics, variability analysis, reliability analysis and regression analysis.

This study found that learners' intention had higher averages in the Learning Outcomes and Personal Experience factors. And lower standards in the Social Presence and Digital Divide factors indicate that learners' learning The motivational factor is not the lack of digital ability or the concern about learning with students from different social backgrounds, but the learning effectiveness and personal learning experience as the primary consideration.

This study had deeply understood learners' study intention in online learning, including Social Presence, Personal Experience, Digital Divide and Learning Outcomes. Still, most learners feel they are in the same learning environment with different social backgrounds, and they do not think of any technological barriers. In the future, they will consider choosing courses in the online learning mode and using online learning to replace other learning channels. It proves that the final learning effect and personal learning experience are significant. Finally, this study proposes methods for the four influencing factors provided to Hong Kong learners and educators as a reference.

ACKNOWLEDGMENT

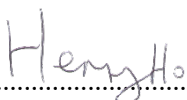
I would like to say a special thank you to my supervisor, Dr Joe Leung. His support, guidance and comprehensive insights in this dissertation have made this an inspiring experience for me. His advice helped me in all times of the research and writing of this dissertation. Good time management gives us sufficient time to review this dissertation to make it high research value.

Besides my supervisor, I would like to thank my fellow classmates, Mr Arthur Ang and Mr Tony Lui. I appreciate that we can share our insights on a different areas and provide more information and ideas on this dissertation. We can correlate support together to complete our MBA course and the dissertation. We hope we can keep our friendship forever.

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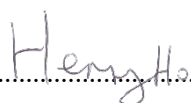
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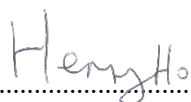
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CHAPTER ONE: INTRODUCTION

1.1 Research Background

Digital education is the innovative use of digital tools and technologies in the teaching and learning process, usually referred to as technology-enhanced learning (TEL) (Kirkwood and Price, 2013) or e-learning (Sangrà, Vlachopoulos and Cabrera, 2012). Exploring digital technology allows educators to design engaging learning opportunities in the courses they teach. These opportunities can take the form of hybrid or fully online courses and programs.

Online learning is one of the rapidly emerging trends in this digital age. Its growth is enormous, and it shows no signs of abating. Among them, online learning is usually referred to as one of the e-learning modes. This learning model provides flexibility in time and place, making online learning an increasingly popular form of education worldwide (Berge, 1997).

1.1.1 The Impact of COIVD-19 on Online Learning and Teaching in Hong Kong

At the beginning of 2020, a COIVD-19 pandemic broke out globally, causing schools to close and suspend face-to-face classes. Many students failed to return to school to participate in face-to-face classes. The pandemic caused the entire education industry to change rapidly from traditional face-to-face teaching to online teaching. Let students achieve the concept of "suspension of classes without suspension learning" (HKSAR Education Bureau, 2020). And now the pandemic seems to be alleviated, and the school resumed regular face-to-face instruction, the learners will keep the Intention on online learning or not. That is the aim of this research study.

1.1.2 Background Digital Learning and Trend

Digital learning (E-Learning) was first proposed by Jay Cross and Elliott Masie in 1999 (Cross, 2004). E-learning uses network technology to design, provide, select, manage and extend learning. Different interpretations and terms have emerged with the advancement and development of technical tools, such as Internet-based training, web-based training, online education, network learning, and distance learning.

The application includes network-based learning, computer-based learning, virtual classrooms, and digital collaboration. A researcher regarded digital learning as a tool to obtain

digital teaching materials for online or offline learning activities through wired or wireless networks (Lin, Chen and Liu, 2017). E-learning offers the ability to share material in various formats such as videos, slideshows, word documents and PDFs, conduct webinars (live online classes) and communicate with professors via chat and message forums is also available to users (Epignosis LLC, 2014).

The research and development of digital learning technology have become the focus of improving and reforming the educational environment. Through the digital interface, the Internet and multimedia teaching materials combine with the learning content to integrate information and extend knowledge to enhance students' learning motivation and effectiveness.

1.1.3 Background of Online Learning Benefits

One of the significant definitions of online learning is that learners and teachers entirely use online synchronisation or non-synchronisation remote teaching and learning (Moore, Dickson-Deane and Galyen, 2011). Students use personal electronic devices, such as desktop computers, laptops, tablets, or mobile phones, pass through the virtual classroom such as Zoom, MS Team, Google Classroom, Blackboard Collaborate and Tencent Meetings (G2 Grid, 2020) or use learning management system (LMS) such as Blackboard, Moodle, Google Classroom, Schoology (Brown, 2021) to conducting the course anytime and anywhere. Online course providers can provide virtual classroom software and use it to lecture. The virtual classroom may integrate the learning management system (LMS) or independent system integration.

According to a 2017 survey, online learning can increase the retention rate of learners from 25% to 60% (Pezold, 2017; Chandler, 2017), which is different from face to face tutoring, which has a retention rate of 8% to 10%, because the learner can quickly review the material. They can tend to have more control over the process of learning. Table 1.1 compares the advantages and disadvantages of online education and traditional education.

Table 1.1. Traditional Education and Online Education Comparison		
	Traditional Learning	Online Learning
Learning	Passive	Initiative
Reduce costs	Limited	Easy
Information update	Slow	Rapid
Time limit	Yes	No
Location restrictions	Yes	No
Communication	One-way or two-way	Diversification
Source: Illustrated by the author		

1.1.4 Background of Online Education Market Growth

The COVID-19 pandemic has led to the closure and closure of schools and universities around the world, which has encouraged the increase in enrollment of online and distance learning, which is conducive to market expansion. During the pandemic, the global e-learning market in 2020 is estimated to be USD 250.8 billion, and the revised scale is expected to reach USD 457.8 billion by 2026, growing at a compound annual growth rate of 10.3% during the analysis period. Academic is one of the market segments analysed in the report. By the end of the analysis period, the compound annual growth rate will reach 10.2%, reaching 314 billion US dollars (ReportLinker, 2021a). After a thorough analysis of the business impact of the pandemic and the economic crisis it triggered, the growth of the company's division was re-adjusted to a revised 10.6% compound annual growth rate for the next 7 years. The ongoing digitisation of content in the academic field and the increasing number of students enrol in part-time and full-time online courses support the educational field's growth.

By 2021, the e-learning market in the United States is estimated to be US\$90 billion. China is the world's second-largest economy. By 2026, the market size is estimated to reach 105.7 billion US dollars, with a compound annual growth rate of 12.2% during the analysis period. Other notable geographic markets include Japan and Canada, which are expected to grow by 7.6% and 8.6%, respectively during the analysis period. In Europe, Germany is expected to grow at a compound annual growth rate of approximately 9.7% (ReportLinker, 2021b). As public universities, governments, and local suppliers enter the market, the e-learning market in developing regions is developing into a dynamic growth area. Several factors are driving the e-learning market in developing countries. For example, e-learning helps to reduce infrastructure costs and reduce expenditures, such as the cost of classroom space and the cost of purchasing or renting textbooks,

thereby reducing the cost of people in developing countries' education costs. In addition, due to weak public transportation and road infrastructure in developing countries, online learning eliminates logistics problems.

1.2 Research Problems

In Hong Kong, there are 29 tertiary institutions so far, including universities, postsecondary colleges, member institutions of the Vocational Training Council and Self-financing Post-secondary Education (Education Bureau, HKSAR, 2021; CSPE, HKSAR, 2021b). The programme type of courses includes diploma, high-diploma, sub-degree, undergraduate, taught postgraduate, research postgraduate, and various certificates. And total student intakes of those programmes are approximately 180,000 (CSPE, HKSAR, 2021a).

By July 2020, the UN Educational, Scientific and Cultural Organization (2020) reported the COVID-19 pandemic had affected more than 1.2 billion students in 186 countries by school closures. Colleges and universities must suspend face-to-face classes and switch to online teaching. In 2021, along with the pandemic in many countries of the world has slowed down and effective anti-pandemic policies, schools have begun to respond to face-to-face instruction. However, due to anti-pandemic policies, schools have restricted the number of classes, and some overseas students have not returned to school to attend classes. Students must use the online model by using various platforms to participate in the courses.

This online learning model has rapidly changed the global education market ecology. Can online learning encourage learners to continue choosing or accepting this new learning normal? However, both learners and academics want to know whether online learning will continue after the pandemic and how this shift will affect the global education market will be the motivation for this research.

1.3 Research Aim and Objective

This study explores the learner's intention to study online Higher Education in Hong Kong.

- a) Exploration of the intention factors towards online Higher Education in Hong Kong;
- b) Identification of the intention factors towards online Higher Education;
- c) Analysing the relationship of intention factors towards online Higher Education;
- d) Provide recommendations with a marketing strategy for the Higher Education educator and Learning Management system administrator.

1.4 Research Questions

Hong Kong has promoted digital education since 1997. But Hong Kong used traditional teaching methods before the pandemic, and it relatively lacked online or e-learning.

The research purpose of this study is to reopen face-to-face courses after the pandemic has eased and determine whether students still have the motivation to continue choosing online learning without going back to school to attend classes. Therefore, the questions discussed in this study are as follows.

- Exploring the factor of learners' social presence how it affects the study intention of online learning.
- Exploring the factor of learners' personal experience how it affects the study intention of online learning.
- Exploring the factor on learners' digital divide how it affects the intention of online learning.
- Exploring the social presence, personal experience and digital divide to study intention relationships.
- Explore study intention to learning outcomes relationship on online learning.

1.5 Research Contribution

This research report mainly studies whether social presence, personal experience, learning rewards, and the digital divide are directly related to learning Intention. And this research is for those learners preparing to enrol in any courses, whether they will choose online learning. And the results of this research can enable course providers or colleges to design an effective and seamless online teaching environment, thereby enhancing learners' motivation for online education. Table 1.2 shows that people in four categories will benefit from the results of this research. The list indicates their role and contribution.

Table 1.2. The List of Stakeholder Roles and Contribution		
	Role	Contribution
Institutions	These persons determine goals, content, delivery systems, interaction, and evaluation. Usually, it is a team of subject matter experts, educators, instructional designers, and production personnel.	Will know the learners' requirements for online learning courses and which factors can promote learners' intention for online learning.
Learning Management System Designers	People who design the cyber and digital environment for effective teaching and learning.	Will know learners' habits of using online learning platforms. And provide suggestions for improvement.
Learners	People who participate in online courses or learning through all online learning platforms or software	Will know which factor can influence their intention on using online learning.
Educators	People who design the course and set the needs of students. Educators have a role in guiding the students.	Will know the difficulties learners face when conducting online learning courses and the importance of teachers leading the online learning atmosphere.
Administrator / Directors	In all institutes, people direct planning, implementation, and evaluation of the education process.	Will know how to compile courses based on the requirements of learners and continue to improve the online learning environment.
Source: Illustrated by the author, İşman et al., 2004		

1.6 Research Limitations

Since most of the research data and literature are based on overseas regions, there are less data in Hong Kong. Most of this research cited overseas scholars' research reports and literature as the reference basis.

Hong Kong education has always used e-learning as a part of learning. However, due to the geographical location and advanced transportation in Hong Kong, it is relatively convenient for students to return to school to attend classes in overseas areas. Distance learning may not be fully utilised in Hong Kong. Before the pandemic, Hong Kong schools still focused on face-to-face instruction. Although some courses offered online teaching, most were aimed at overseas students and did not benefit local students.

Since the school has implemented online synchronous teaching during the school closure period, most students now have an essential online learning experience. But whether these experiences can become their future online courses or be used online as a learning model, people of different ages may also have different positions on online learning. This study may not be able to cover people of different ages fully. Further research can be in-depth to find out more relationships.

1.7 Chapter Arrangement and Key Description

To carry out research work more efficiently and in an orderly manner, the researchers will follow the logical sequence of achieving the research goals and make the following brief overview of the main structure of the paper.

Chapter 1 introduces the research background to identify how digital learning, online learning, and online education are affected by COVID-19 to make them have speedy growth. And stated the research problem, aim and objective on learners willing to shift their study intention to online learning in Hong Kong Higher Education.

Chapter 2 will be considered the literature review to intensely discuss relevant study results on social presence, personal experience, digital divide, study intention and learning outcomes of learners who use online learning. The literature review can provide theoretical support for achieving the study target of this dissertation.

Chapter 3 will discuss the methodology of this study based on literature review and guide specific research and investigation through clear research examples and methods.

Chapter 4 is mainly about collecting and analysing survey data to verify and discuss the research results of this study.

Chapter 5 mainly provides a recommendation for the stakeholder and organisation to get the beneficiary and conclude this research.

1.8 Summary

This chapter has established that this research will use online higher education learners' intentions as a research motivation, research questions, and research objectives. The research background shows that Hong Kong always has focused on traditional face-to-face instruction. E-learning only occupies a part of the entire learning stage or only uses the learning platform to browse course resources. Online learning was not fully utilised until the pandemic caused the school to suspend classes. Then face-to-face teaching was converted to online education, which accelerated the rapid development of Hong Kong and worldwide online education-related industries.

Whether learners' willingness to learn online will increase due to the changes in their learning mode under the pandemic situation and which factor will most affect their desire. This study will use the literature to review various factors and use questionnaires to collect Item data and analyse the relationship between the data to determine whether hypotheses positively correlate with study intention. The next chapter will be a literature review of each influencing factor's definition, measurement, and application.

CHAPTER TWO: LITERATURE REVIEW

Chapter two is considered the literature review to intensely discuss the relevant study of Social Presence, Personal Experience, Learning Outcomes and the Digital Divide of those factors affecting learners' intention to use online learning. The literature review can provide theoretical support for achieving the study target of this dissertation.

2.1 Review Focus on Social Presence

The theory of social presence can be traced back to the work of Short, Williams, and Christie in the 1970s. Short, Williams, and Christie (1976) are interested in how the media affects communication. They believe that certain media are better at establishing the quality or status of "existence" than others. However, as people began to participate in the online learning environment, online educators questioned Short and others' technical deterministic understanding of the social presence (Lowenthal and Dennen, 2017). But today, Social presence (SP) is still one of the most crucial components of the quality of the online learning experience from the student's perspective (Horzum, 2017).

2.1.1 Definition of Social Presence

The concept of social presence originated from Morton Wiener and Albert Mehrabian's research on immediacy and the intimacy concept of Michael Argyle and Janet Dean (Cui, Lockee and Meng, 2012). Wiener and Mehrabian identified immediacy as nonverbal communication behaviours, such as eye contact and body movements, enhancing intimacy in interaction. Argyle and Dean pointed out that intimacy is a combination of eye contact, physical proximity and smile, so the social existence brought out by different scholars can be divided into face-to-face communication and online interaction.

The social presence theory is defined by the distinct physical proximity produced by various media. The two more popular media are face-to-face communication and online interaction. Social presence is measured by the ability to project physical and emotional existence and experience from others in the exchange. Effective communication is measured by the interpersonal participation of all parties while taking into account the limitations of the communication medium used (Grieve, Padgett and Moffitt, 2016).

Social presence can be applied to different occasions. So its definition is inconsistent, but scholars try to determine what this phenomenon contains and how to adjust it with the emergence of new interpersonal communication media. In recent years, social presence has been defined as the sense of community learners experience in an online learning environment. For example, learners develop various non-verbal intimacy behaviours in online communities. When the students communicate in media without real-life contact, can these behaviours enhance the interpersonal relationship between learners? (Marcia, 2016).

2.1.2 Measurement of Social Presence

Online social presence is a significant factor contributing to interaction in online learning environments. For this reason, researchers from several different viewpoints have been interested in studying ways to enhance social presence by identifying the underlying factors of online social presence (Sung and Mayer, 2012). Tu and McIssac (2002) and Yen and Tu (2011) suggested four dimensions of social presence: social context, online communication, interactivity, and privacy.

Social context refers to the specific environment in which social interaction occurs. In other words, the meaning of a particular action or behaviour must be understood relative to the environment and system to which it belongs. Learners with different social backgrounds and characteristics are distributed in the school environment in higher education. Educators and policymakers must be aware of differences in student backgrounds, social trends and resources to provide equal educational opportunities (Young and Smith, 1997).

Online communication refers to people using digital media to communicate, connect, trade, send, or receive information through the internet. All communication via the internet is called online communication. As we have more and more online presence, this type of communication is becoming as important as offline communication (Bhasin, 2021).

Interactivity in the digital world refers to the dialogue between a human being and a computer program, such as accepting and responding to input from people like word processors or spreadsheet applications. In Social presence, interactivity also refers to the activities computer-mediated communication (CMC) users participate in and their communication methods. Therefore, social presence refers to the degree of sensation, perception, and reaction that CMC connects to another intellectual entity through text-based encounters (Tu and McIsaac, 2002b).

Privacy on the internet or social networking concerns a subset of data privacy, involving the right to enforce personal privacy, storage, reuse, provision to third parties, and display information about yourself through the internet (Harris, 2012). In social presence, Online privacy may critically impact an online learning environment. The learners shared personal information on the CMC, and they knew it was risky, but they still had less security consciousness. Email is the most private among the three CMC systems, followed by one-to-one real-time discussions and many-to-many real-time discussions. The bulletin board is believed to provide the least privacy (Tu, 2002).

2.1.3 Applications of Social Presence in Online Learning

Researchers have been trying to explain the relationship between personal social practice and social presence within the online environment for a long time. They believe that relationship formation and information exchange play a supporting role in an intermediary environment.

Scholars bring out the importance of social constructivism for online learning practice from social presence. Social constructivism reminds us that learning is essentially a social activity, and meaning is constructed through communication, collaborative activities, and interaction with others. They have emphasised social interaction's role in creating sense and building knowledge (Swan, 2005). Social constructivism is used as a theoretical framework. Social presence becomes crucial because it connects individuals in an online learning environment and actively motivates them to build knowledge and make meaning. For example, Hill, Song, and West (2009) suggested that the online environment should support learning practice through interactive learning methods, allowing learners to interact with others while observing the results of the interaction and responding. The literature shows that social existence supports and promotes personal communication and learning online.

2.2 Review Focus on Personal Experience

Computer technology communication (CMC) is the primary online learning medium, different from a traditional on-site learning environment in some fundamental aspects. For learners, their online learning experience in an unfamiliar environment requires individual adaptability and coping skills. Many learners may take online courses without any guidance and may have sufficient knowledge of the online environment to complete the course-learning the new skills needed is not comfortable (McGilvray, 2014).

2.2.1 Definition of Personal Experience

A personal experience or experiential learning is an instantaneous experience and sensory awareness of internal and external events, or the sum of experiences that form a unity of knowledge, such as the life cycle. Personal experience can reflect the learner's understanding of the matter and the kind of experience that can affect the willingness and satisfaction with the matter.

When learners study online, course discussion seems to be one of the most influential functions of online courses. They believe that student interaction is an essential factor in the success of online classes (Swan et al., 2000). When learners can feel their identity during their studies, they can increase their Intention to choose online learning. Because one person in one space usually carries out an excellent online learning environment. Some personal factors such as having a good learning environment, unique characteristics and interpersonal communication skills will directly affect learning intentions.

2.2.2 Measurement of Personal Experience

Many factors will influence learners' online learning experiences. A researcher found learners' perceptions of practical and challenging components in learning online reported that lack of community and difficulty understanding instructional and solving technical problems were challenges in their online learning experiences (Song et al., 2004). And some other factors identified by other researchers are learner characteristics (Howland and Moore, 2002) and the design of the learning environment (Clark, 2002; Dwyer, 2003; Song et al., 2004).

Lack of community is one element that negatively affects the learning experience in online courses, although feelings of disconnection and isolation did not cause learners to abandon online courses. But researcher, Phirrangee and Malec wrote. "The experience of being alienated creates

a disconnect from peers and mentors, resulting in a feeling of isolation and lack of community (Lieberman, 2018).

Learner characteristics is a concept that revolves around how a student's learning experience is affected by personal, social, cognitive and academic factors. It is speculated that these aspects play a pivotal role in the way and content of student learning. Through a series of studies, educators can determine which characteristics have the most significant impact on students. This research will be passed on to instructional designers to develop tailored instruction for specific groups (Drachsler and Kirschner, 2012).

Technical problems refer to effectively solving problems when faced with unforeseen equipment problems, such as hardware failures or software errors. Due to sudden changes in learning patterns, many learners are not well equipped with the high-speed internet connections and computer equipment required for online learning. Therefore, learners face problems connecting virtual learning platforms and using software to conduct their online learning. They face technical issues because they do not know much about technology and computer applications. An unstable Internet connection can affect the stability of classroom video and audio. If the learner has insufficient knowledge of the equipment or software or lacks guidance, it can be challenging to perform the required operations (Anu, 2021).

Learning environment refers Schell & Janicki (2013) suggested an excellent online environment is an effective platform to promote constructivist learning because it meets the needs of students to access academic courses at any time while also improving their communication skills. However, constructivism fosters collaborative learning or group activities through peer interaction, challenging the online learning environment (Huang, 2002). As students are accustomed to the traditional classroom learning model, they find it challenging to adapt to the online learning environment immediately. However, students who have been studying in conventional classroom thinking cannot focus on the online platform all at once. Providing a highly accessible online learning environment can let students accept the new learning models.

2.2.3 Applications of Personal Experience in Online Learning

Student interaction is essential for online social cohesion and collaborative learning. Although, the flexibility of online courses provides learners with a more independent learning experience. Since online learning uses computer technology communication (CMC) as the primary learning medium, the personal experience is different from face-to-face in terms of the learning environment. For students, an online learning experience in an unfamiliar environment requires personal adaptability and coping skills. Many students may take online courses without guidance and not know the online environment to complete the course. It is not easy for learners to master the required skills (McGilvray, 2014).

When online learners adapt to the computer-mediated communication (CMC) medium of the online environment, previous studies have pointed out that the limitations of written communication and lack of interpersonal interaction have made it difficult to adjust and respond to the online learning environment and identified four main themes: inability to fully express oneself; difficulty in building relationships; lack of experience in solving technical problems and failure to adapt to the new online learning environment, etc. (Huang, 2002 & Symeonides and Childs, 2015). In addition, research has also shown that internet novice learners have a high degree of anxiety when learning how to communicate online. Still, as they become more familiar with the media and establish relationships with other students, their pressure will gradually decrease.

Those who lack personal experience will find this learning process complicated, but those familiar with online learning still feel anxious. Therefore, the research results emphasise better cooperation between students and mentors to promote a safe and interactive environment. Adequate academic and social support can enhance online learning, increase student satisfaction, and encourage students to continue studying.

2.3 Review Focus on Digital Divide

The digital divide refers to the differences in opportunities and abilities for people of different gender, race, economy, living environment, and class backgrounds in society to approach digital products, such as computers or the internet. In simple terms, observing the digital gap can be evaluated from two significant aspects: the opportunity to use computers and the internet and the ability and cognition of computers and the internet. Although the term now encompasses the impact of available technology and financial capabilities, the gap it refers to can continue to change as technology develops. Digital Divide was first used in the late 20th century, and it described the gap between those who could use mobile phones and those who could not. (Taylor, 2021).

2.3.1 Definition of Digital Divide

Mossberger et al. (2003) defined the digital divide as "the patterns of unequal access to information technology based on income, race, ethnicity, gender, age, and geography" (Mossberger et al., 2003). Using electronic devices proficiently and steadily using the internet to access the learning platform is essential for students learning experience. Scholar Berge has expressed concern about the digital readiness gap in 2005 and how teaching methods in different countries may affect students' online learning experience. Digital readiness refers to the availability and adoption of information technology and infrastructure in a country (Yan et al., 2021).

2.3.2 Measurement of Digital Divide

Measuring the digital divide involves many standards, which can include: network access, personal capabilities, knowledge of computing applications, equipment operation, etc. In addition, the calculation method of the technology gap can be different from different perspectives, and all have a reasonable basis. Educators should pay attention to the digital divide between students when designing courses in online education. Students who do not have internet facilities at home or even computers will not cause students to impact their learning performance due to the digital gap.

Digital citizenship refers to the ability to actively, critically and competently participate in the digital environment, use effective communication and creative skills, and use technology responsibly to practice social participation that respects human rights and dignity. In an online learning environment, digital citizenship is about whether students can and tend to use digital technology. For individuals, effectively living, learning, and participating in the digital society as a citizen and their future careers is a critical ability (Law, 2021 & Council of Europe, 2021).

Digital competence is the core element of digital citizenship capabilities. Capabilities require citizens to master the basic skills in all five key areas of digital literacy, including information and data literacy, communication and collaboration, digital content creation, digital security, and the use of information and communication technology to solve problems. However, most citizens or students are not capable of handling complex tasks. For example, they cannot use multiple selected keywords to formulate a good search to obtain the key results or evaluate the relevance or credibility of information. And also unable to develop suitable communication methods for specific purposes or specific audiences (Institute for Prospective Technological Studies Joint Research Centre and Ferrari, 2012).

Technology access has a relationship between technology access and students' academic performance who can effectively use technology access. There is a relationship between the use of digital media and students' academic performance. The more time students use technology. The more diverse the activities students participate in when using computers. The increased diversity of activities has created more opportunities to participate in their own choice of academic activities. Failure to use technology effectively will create a technological divide in primary education and affect higher education careers (Brown, 2018).

Family support constitutes an essential factor to be dealt with during online learning. Students with low technology access capabilities need family support or guidance because family members may have the required digital capabilities. However, when some families do not have such digital ability support, participation will be reduced, learners' ability in distance education will decline, and students will be in social inequality. Soft computing skills and digital literacy in the learning environment can also exacerbate the digital social disparities. This situation will be affected by the student's family status, such as economic, labour demand, availability and

accessibility of digital devices, and environmental variables related to education methods (Sosa Díaz, 2021).

2.3.3 Applications of Digital Divide in Online Learning

Technology access and Digital competence issues surrounding the use of equipment may also affect students' online learning experience. Scholars believe that students need to have a high level of digital literacy to find and use relevant information and communicate with others through technical equipment. Students who lack this ability may experience difficulties in online learning (Barbour and Reeves, 2009). During the pandemic, schools all over the country were conducting online teaching. The WHO (2020) found that an essential factor influencing students' failure to adapt to online learning is the lack of accessibility to appropriate technical equipment. The reason is that students fail to use appropriate equipment such as desktop or laptop computers and are proficient in using the equipment. Even in higher education, about 76% of students report that their online learning equipment is incompatible. Only 15% of students use computers for online learning and approximately 85% use smartphones. And smartphones often fail to meet the requirements of online learning. If students encounter internet connection problems and fail to use technical equipment properly, it may affect their online learning experience. However, when learners participate in online learning, they need to rely on motivation, attention, attitude, parental skills, and family companionship strategies. Learners must rely on parents' participation and support in online education (Sosa Díaz, 2021).

2.4 Review Focus on Learning Outcomes

Online learning does have many advantages, especially in the current digital learning environment. Still, on the other hand, some concerns will lead to the loss of online learners and ultimately hinder the progress of online courses. Lack of interest or motivation is one of the main factors hindering the growth of online learning, and this approach has also increased the dropout rate of online courses. Researchers, educators, and other professionals want to know whether e-learning can provide better results and academic achievements than traditional learning.

2.4.1 Definition of Learning Outcomes

Katz et al. (2011) pointed out that words such as academic performance, learning outcome, or academic achievement are express the same concept that a student's academic work continues

through a learning stage to achieve a particular result. One of the studies (Lin, Chen, and Liu, 2017) showed that teaching effects could be improved if practical teaching strategies are developed, combined with current online teaching trends, and digital learning to achieve learning motivation. Learning outcomes can have a significant positive impact on the intention of online learning.

The learning outcome is an indicator of the success of the academic program/curriculum. Whether it is a short-term course or a regular course, the learning results should be listed and recorded before the start of the class to understand and check whether the course design and implementation are perfect. The results show that the specific plan to achieve the goal and the teaching environment, learning activities and evaluation plan is appropriately designed based on the determined learning results (Mahajan and Singh, 2017). Online courses should also follow this indicator for course design to implement and let learners complete the course/plan successfully.

2.4.2 Measurement of Learning Outcomes

The Technology Acceptance Model (TAM) can provide a theory to measure the factors that affect students' online learning outcomes and the use of technology. A researcher proposed TAM to explain people's attitudes and behaviours in adopting technology in the presence of other external variables. This model is often used to study user behaviour to understand why they accept or resist information technology. However, information technology plays a vital role in online education, and it can encourage innovation, provide new learning environments, and change existing teaching models (Eksail and Afari, 2019).

Online education is all about the convenience of IT operations. The convenience of operation, best user experience and proficiency in information technology can immediately impact learners' perception and intention. Many research has shown that factors in TAM, such as perceived ease of use and usefulness, can positively affect educators' and learners' achievement of the learning outcomes (Pham, Le, and Do, 2021).

Perceived ease of use refers to whether these resources are easy to use and access when using technology to acquire knowledge, obtain information, and browse learning resources. Due to the use of online learning platform functions to realise knowledge sharing and learning have become a daily learning demand. Literature studies have shown that online media, platforms, and computer devices' ease of use, accessibility, and transmission speed can affect learning. The adaptability of

online education is due to the easy access to resources and equipment, which produces positive results to promote the knowledge sharing process (Khadija Alhumaid, 2020a).

Perceived usefulness measures how learners believe that online learning can help improve their performance and achieve learning goals. The practicality of online education is proven by assisting learners to save time and cost of returning to school and using various methods. Literature studies have shown that perceived usefulness will positively impact learners' attitudes and intentions, thereby improving learning outcomes (Khadija Alhumaid, 2020b).

Course content and design can be more exciting and well structural, and it can attract students to participate actively and enhance learning initiative, thereby affecting learning outcomes. The content of E-learning includes the structure and content within the learning objectives. In addition, e-learning content can also provide additional teaching materials to help students gain a more precise and deeper understanding of knowledge. This factor helps to improve students' analytical and critical thinking and problem-solving skills (Akyüz and Samsa, 2009).

Learner characteristics can be referred to if the learners are more active, have self-learning ability and compliance awareness, better learning results can be obtained. Learners need to know how to socially interact with lecturers and co-learners, which is essential for improving online learning. Through strong interaction and consistent learning outcomes, the effectiveness of online learning can be achieved. Since online learning regulations and environmental requirements are relatively relaxed, learners need greater self-discipline and self-learning ability. If the learner lacks these characteristics, the learning mode process will be more challenging to control than traditional methods. So characteristics is also an essential requirement for learners (Jung et al., 2002).

2.4.3 Applications of Learning Outcomes in Online Learning

Learning outcomes can help teachers and students reach a consensus on the goals and objectives of the course or academic planning. Teachers can provide students with a transparent and practical approach by supplying precise and comprehensive learning outcomes. Similarly, learning outcomes are guiding tools that guide students to achieve the expected results of the learning plan. The learning outcomes also show teachers and help them understand the path to follow in academic planning and make students aware of the goals they can achieve at the end of their studies (Mahajan and Singh, 2017).

According to Bernard, Borohovsky, Schmid, Tamim and Abrami (2014), in online learning, learners can gain more knowledge from online learning than in traditional education, measured by course completion rate, student satisfaction, and enthusiasm level. Multiple studies have also concluded that online learning achieves better results than conventional methods (S. Lockman and R. Schirmer, 2020).

2.5 Study Intention and Learning Outcome Relationship

Chartrand (1992) pointed out the importance of conducting research that assesses the impact of learning outcomes on continued study intentions. Loewenstein, Weber, Hsee, and Welch (2010) also define intention as the effort a person is willing to make to achieve a goal and make plans to achieve this goal. Intention can be regarded as the goal state in the anticipation value tradition, resulting from a conscious process that takes time, careful consideration, and attention to consequences. Although learning results can be affected by many factors, The current study attempted to use the aspects reviewed in the literature and test the relationship between learning outcomes and study intentions.

With the advancement of information technology, the applicability of online learning to various disciplines has been enhanced, and the subjects and methods used in the teaching field have become increasingly diverse. Online learning has been regarded as improving the quality of education, creating a high-quality learning environment, and lifting the time and space constraints on knowledge and effective direction of efforts to improve teaching management. With the digitisation of learning content and learning process, it is expected that the learning effect can be enhanced by its fast, efficient and far-reaching characteristics. To achieve meaningful and practical learning, mastering its concepts proficiently depends on the inner psychological motivation of students. Suppose a learner wants to acquire knowledge through online education. They believe that online learning contributes to higher grades or praise and demonstrate an expectation to gain a broader range of knowledge from online learning, improving their positive psychological functions, including learning satisfaction, engagement, and self-identity (Li, 2017; Tsai et al., 2021).

Relevant studies have pointed out that students with high learning motivation will have more precise goals, a strong desire to learn the learning content, higher expectations for results, and

better self-efficacy. The research found that Students' learning motivation positively impacts learning outcomes (Afzal et al., 2010). Discover the correlation between motivation and academic achievement. The study found that students with high learning motivation performed better, and students with intrinsic motivation performed better than those with extrinsic motivation. It was also found that a high intention to learn will lead to having better learning outcomes (Ismail et al., 2010; Tsai et al., 2021).

2.6 Summary

This chapter reviews various focused factors on social presence, personal experience, learning outcomes, and the digital divide consorted with study intentions of using online learning. Determine the definition, measurement and application of each independent variable are identified. The research hypothesis and framework are put forward to discuss the relationship between various elements. In the next chapter, the research methodology will provide appropriate research methods and the design of this research to determine the way of data collection and analysis.

CHAPTER THREE: RESEARCH METHODOLOGY

The research methodology chapters show how to get the final research results while meeting the research goals. Therefore, this chapter will discuss the research methods used in this research process. It includes research design, data sources (primary and secondary data), demographic considerations, sample size, and research schedule.

3.1 Research Methods

The research method shows the research path to formulate the problems and goals and presents the results based on the data obtained during the research period.

3.1.1 Qualitative Research

Qualitative research involves collecting and analysing non-digital data (such as text, video, or audio) to understand concepts, opinions, or experiences. It can gather in-depth insights into problems or generate new ideas for research. Qualitative research is the opposite of quantitative research, which involves collecting and analysing numerical data for statistical analysis. This research focused on using a literature review to support the discussion and definition of this research report (Bhandari, 2020a).

3.1.2 Quantitative Research

Quantitative research is the process of collecting and analysing numerical data. It can be used to find patterns and averages, make predictions, test causality, and generalise the results to a broader population. This study will use questionnaires to collect relevant data to support research questions and test the relationship between hypotheses. Quantitative research methods can use descriptive, correlation or experimental research to conduct: Only the overall summary of the research variables needs to be sought in descriptive research. In related research, the relationship between research variables is investigated. In experimental research, systematically check whether there is a causal relationship between variables. (Bhandari, 2020b).

3.1.3 Summary of Qualitative and Quantitative Research

Qualitative and quantitative research are the two main research methods used by social scientists, psychologists, and others to learn more about social concepts. Although two research methods are used together in many research, there are still differences. To learn more about these two research methods, researchers should understand them in-depth to help decide which way is more suitable for the research goal to reach the final goal and determine what form to use. Table 3.1 summarises the comparison of qualitative and quantitative research methodology.

Table 3.1. Summary of Two Research Methods		
	Qualitative	Quantitative
Conceptual	- Concerned with understanding human behaviour from the informant's perspective - Assumes a dynamic and negotiated reality	- Concerned with discovering facts about social phenomena - Assumes fixed and measurable reality
Methodological	- Data are collected through participant observation and interviews - Data are analysed by theme from descriptions by informant's - Data are reported in the language of the informants	- Data are collected by measuring things - Data are analysed through numerical comparisons and statistical inferences - Data are reported through statistical analyses
Data Collection Methods	Secondary Data - Literature review - Interview - Focus Group	Primary Data - Surveys - Experiments - Observations
Data Analysis	- To generate results about the research topic - Inferential analysis of the summarised data generates theories or hypotheses.	- Inferential statistics are used to - identify statistically significant differences between groups of data - Descriptive statistics help to summarise data
Key Features	- To provide perspectives in words and other actions. - Qualitative interpretations are constructed/ - The theory is data-driven and emerges as part of the research process - Evolving from the data and integrating scattered data from review	- To determine changes in variables in natural phenomena. - Project the objective reality and exist separately to the researcher - Use to test a theory and ultimately support or reject it. - Take out the extraneous variables by conducting the studies
Advantages	- Can provide a complete picture of answers and reasons behind the ethnographic - Can be used to inform solutions to social issues.	- Specific research problem - Explicit independent and dependent variable - High level of reliability - Minimum personal judgement
Disadvantages	- Not easy to compare - Time-consuming on analyse - An observer may be biased when interpreting	- Limited outcomes due to a structured method - Unablilty to control the environment - Need to deal with a large number of responses
Source: Minichiello et al. (1990, p5), Crossman, 2011, McLeod, 2019, Sisinternational.com, 2015		

3.2 Research Framework

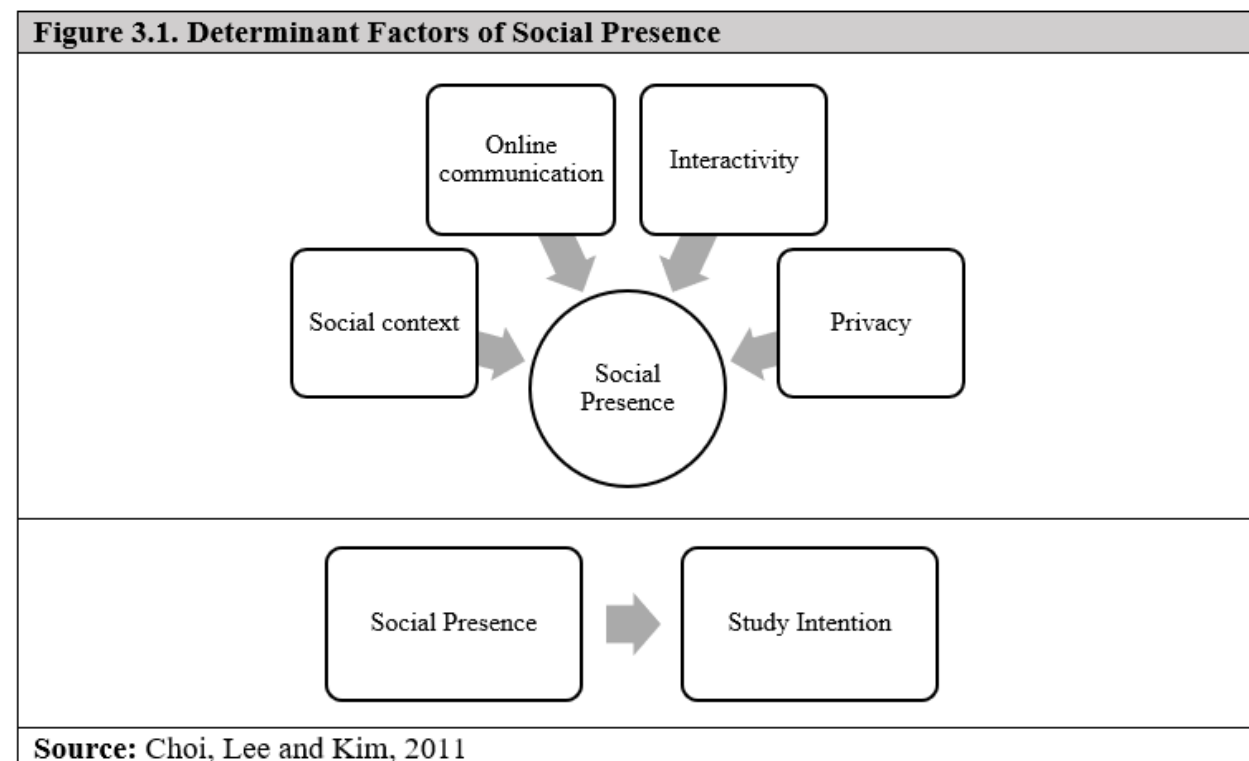
A research framework is a theoretical diagram that displays the independent variable and dependent variable relationship. A well-structured framework can give the researcher a correct direction, allowing them to interpret, explain, and generalise the research findings convincingly in this study.

3.2.1 Relationship between Social Presence and Behavioural Intention

According to a literature review in chapter 2, social presence factors were determined. Figure 3.1 shows the proposed elements with social context (Young and Smith, 1997), online communication (Bhasin, 2021), interactivity (Tu and McIsaac, 2002b) and privacy (Harris, 2012 & Tu, 2002) are the factors related to social presence.

Choi, Lee and Kim (2011) provided the idea that social presence relates to intention. The concept is consort with the perceived learner's social presence will affect the learning intention. So this study will be based on this relationship to support our research hypothesis H1.

H1) Social Presence and Behavioural Intention have a significant relationship.

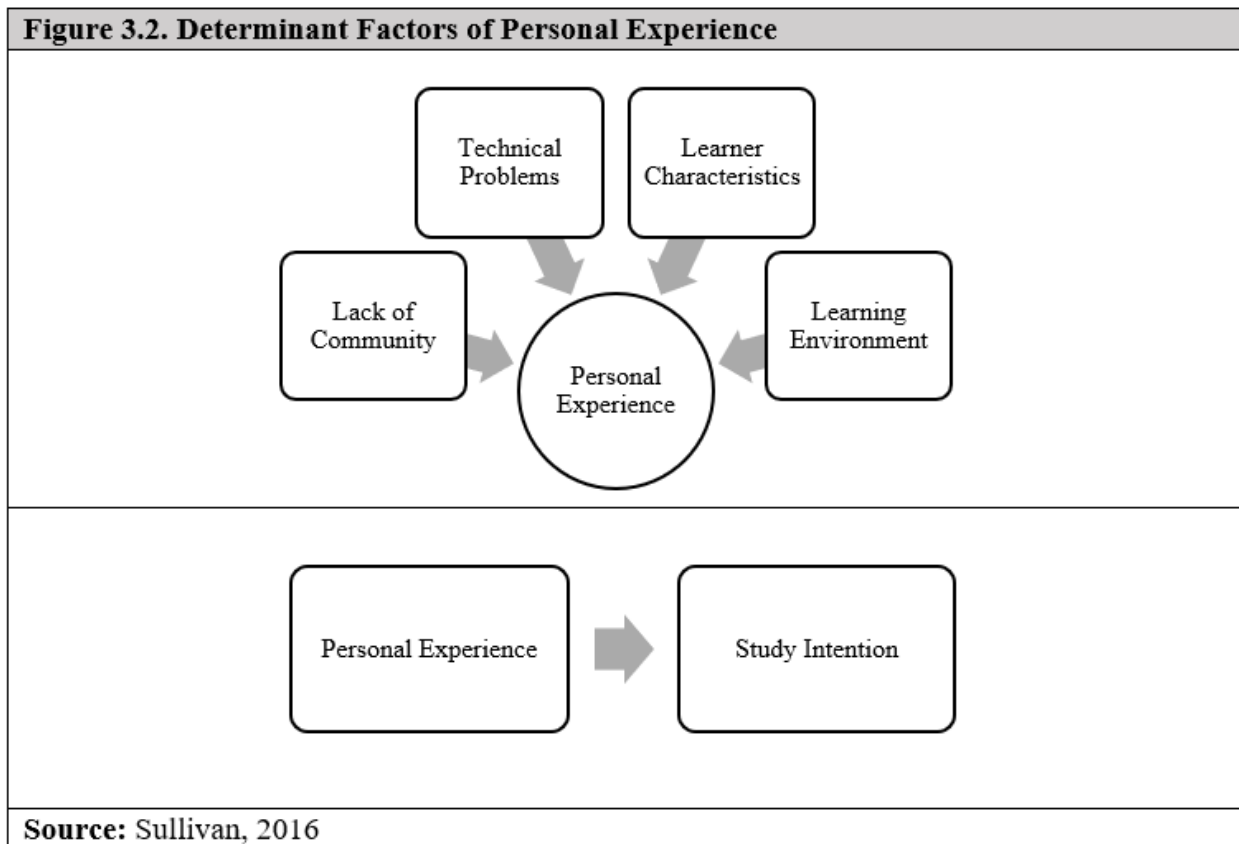


3.2.2 Relationship between Personal Experience and Study Intention

According to a literature review in chapter 2, the factors of personal experience were determined. Figure 3.2 shows the proposed elements with lack of community (Lieberman, 2018), technical problem (Anu, 2021), learner characteristics (Drachsler and Kirschner, 2012), and learning environment (Schell & Janicki, 2013 & Huang, 2002) related to personal experience.

Sullivan (2016) provided the idea that experience relates to intention. The concept is consort with perceived learner's personal experience will affect the study intention. So this study will be based on this relationship to support our research hypothesis H2.

H2) Personal Experience and Study Intention have a significant relationship.

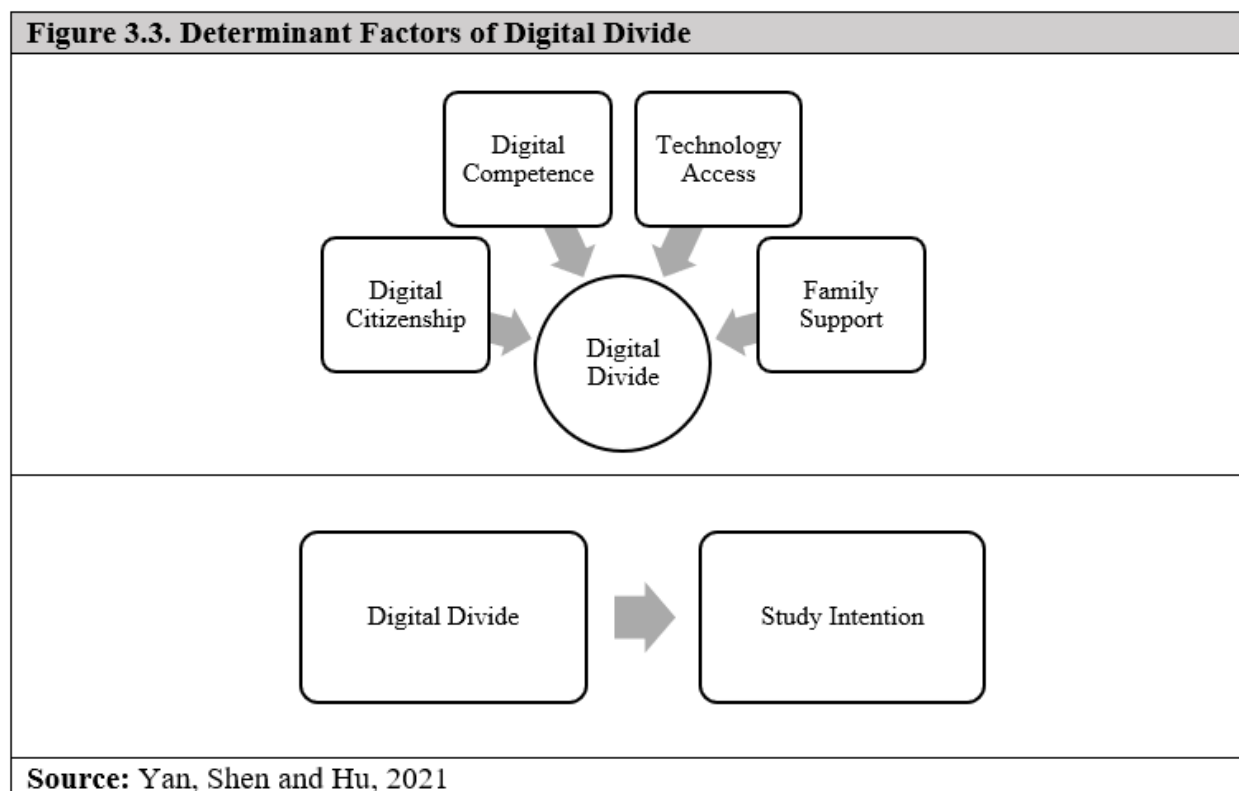


3.2.3 Relationship between Digital Divide and Study Intention

According to a literature review in chapter 2, the digital divide factors were determined. Figure 3.3 shows the proposed elements of digital citizenship (Law, 2021), digital competence (Ferrari, 2012), technology access (Brown, 2018) and family support (Sosa Díaz, 2021) are related to the digital divide.

Yan, Shen and Hu (2021) provided an idea on the digital divide associated with learning outcomes. The concept is consort with the perceived digital divide will affect the learning outcomes. So this study will be based on this relationship to support our research hypothesis H3.

H3) Digital Divide and Study Intention have a significant relationship.

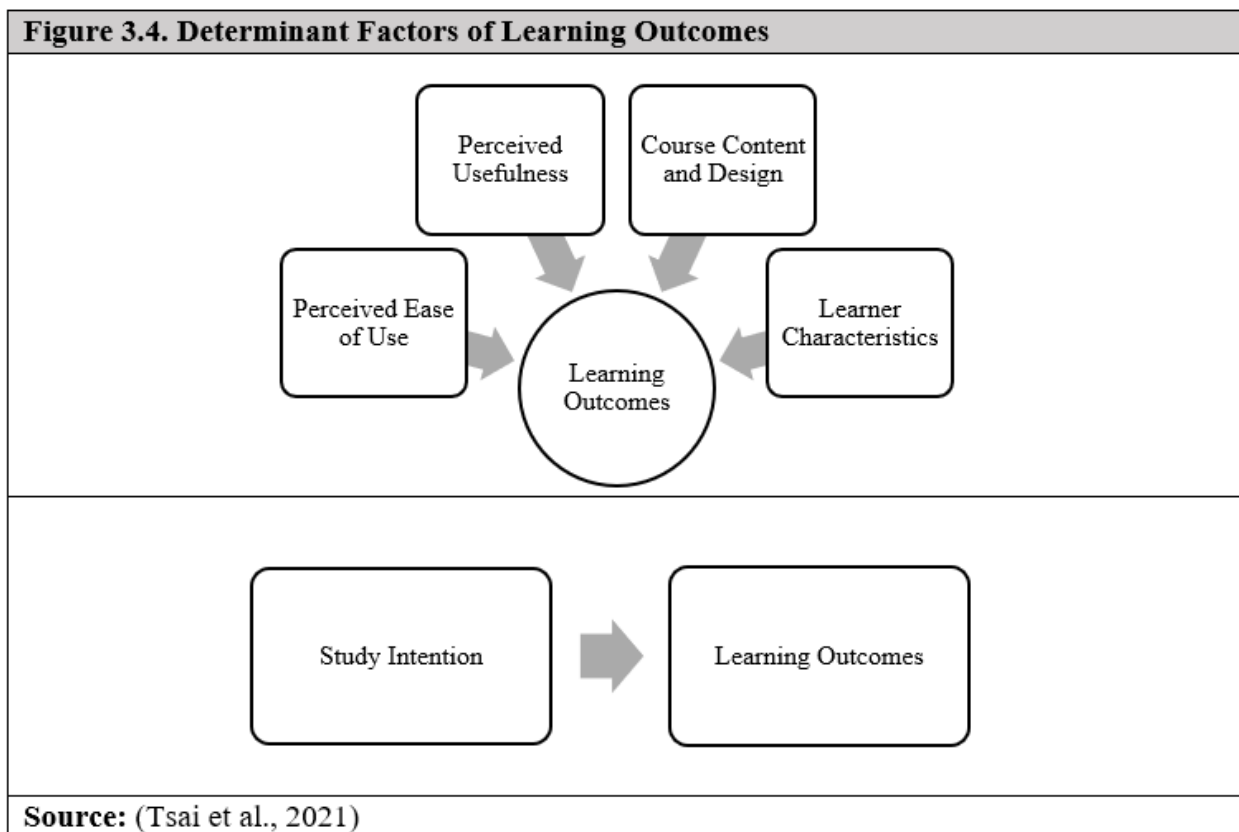


3.2.4 Relationship between Study Intention and Learning Outcomes

According to a literature review in chapter 2, the factors of learning outcomes were determined. Figure 3.4 shows the proposed elements with perceived ease of use (Khadija Alhumaid, 2020a), perceived usefulness (Khadija Alhumaid, 2020b), course content and design (Akyüz and Samsa, 2009) and learner characteristics (Jung et al., 2002) are related to learning outcomes.

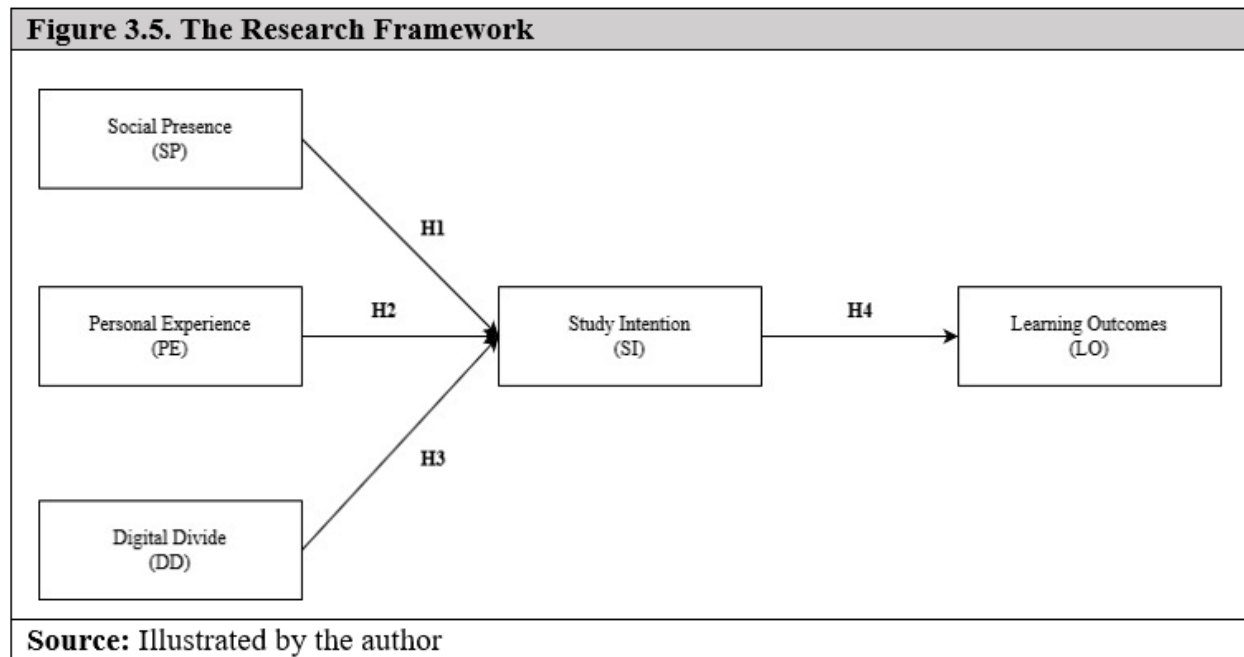
Yan, Shen and Hu (2021) provided an idea of the learning outcomes associated with an intention. And Tsai et al. (2021) proposed that study intention has positively and significantly impacted learning outcomes. Combining the scholar concept to consort with the perceived learner's behavioural intention will affect the learning outcomes. So this study will be based on this relationship to support our research hypothesis H4.

H4) Behavioural Intention and Learning Outcomes have a significant relationship.



3.2.5 Summary of Research Framework and Hypotheses

Although there have been various studies about social presence, personal experience, learning outcomes and the digital divide, any study has not yet investigated the relationships between all of them in one. From this aspect, the study aims to examine the relationships among students using online study intention, social presence, personal experience, academic achievement and the digital divide. The following research hypothesis provided the framework for this study.



H1: Social Presence and Study Intention have a significant relationship.

H2: Personal Experience and Study Intention have a significant relationship.

H3: Digital Divide and Study Intention have a significant relationship.

H4: Study Intention and Learning Outcomes have a significant relationship.

3.3 Research Design

Research design is a plan to describe the data collection method, including primary and secondary data and describe the procedures using a literature review and questionnaire. Research design and methodology are closely related because a good research design ensures that the available data will help answer research questions more effectively. The most commonly used methods include:

- Questionnaire
- Secondary data analysis research
- Mixed method (combination of the above parts)

A mixed-method is more suitable for this research goal than a single method because data can be collected from different approaches and analysed in quality and quantity.

3.3.1 Data Collection

Data collection is defined as collecting, measuring, and analysing accurate insights for research using standard verification techniques. This study will evaluate and cite the hypothesis based on the collected data. In most cases, data collection is the primary and most crucial research step regardless of the research field. Different research fields have various data collection methods, and this study will use the questionnaire survey to collect primary data and a literature review to collect the secondary data

3.3.2 Primary Data

The questionnaire survey will use non-probability sampling to distribute the survey to the participant and use the snowball method to collect the primary data. Snowball sampling is a popular business research method. The snowball sampling method is widely used when the population is unknown. This sampling technique can continue, just like the snowball increases, until the researcher has enough data to analyse. The results obtained can help researchers make wise decisions conclusively (Frey, 2018). After collecting the data, analysing the numerical data is the second stage. This methodology can find patterns and averages, make predictions, causal test relationships, and generalise results to broader populations (Suphat, 2007).

3.3.3 Secondary Data

A literature review is usually an academic paper, book, or other relevant resources to a particular research field. It contains current knowledge, including substantive discoveries and theoretical and methodological contributions based on a given topic. A literature review can be seen as a secondary source of information with no evidence of original or experimental work. The literature review can provide theoretical references to help researchers understand the nature of the research and cite the literature to empirical the research. Therefore, it is imperative to select the primary and secondary sources of the best literature review before proceeding with the actual writing (Strnad, 2019).

3.3.4 Questionnaire Design and Measurement

This research has adopted a questionnaire survey. The questionnaire layout is to compile this research based on the analysis as mentioned earlier factors and approved by the supervisor of reviewing the questionnaire's content, whether the text is appropriate, and provide comments to revision and send the revision questionnaire through the internet by using Google Form. The content of the questionnaire is roughly divided into five categories: Social Presence (SP), Personal Experience (PE), Learning Outcomes (LO), Digital Divide (DD) and Study Intention (SI), with 36 questions. According to the research experience of scholar Berdie (1994), in general, the 5-Point Likert Scale is the most reliable, and the five-point scale is generally expressed as (Strongly agree, agree, neutral, disagree, strongly disagree). If the options exceed 5 points, it is difficult for ordinary people to have sufficient discrimination (Preedy and Watson, 2010). At the same time, based on the consideration that respondents generally tend to be conservative when answering, more scales are not used to measure the questionnaire. Therefore, this study chooses the most commonly used 5-Point Likert Scale in the academic research literature to give 1-5 Points as a measure.

3.3.4.1 Coding of Variables

Each variable is naturally coded and grouped to define the corresponding relationship.

Independent Variables (IV):

SP – Social Presence

PE – Personal Experience

DD – Digital Divide

Moderator Variables (MV)

SI – Study Intention

Dependent Variables (DV):

LO – Learning Outcomes

The content of the questionnaire has consisted of five categories: Social Presence (SP), Personal Experience (PE), Learning Outcomes (LO), Digital Divide (DD) and Study Intention (SI). The respondents need to answer 36 questions with 5 point Likert Scales. Table 3.2 summarises the variable name, coding and Questions distribution.

Table 3.2. Coding of Variable and Questions Source				
Variable Name	Coding	Nature	Questions	Source
Social Presence	SP	Independent Variables (IV)	Q. 1-7	Young and Smith, 1997; Bhasin, 2021; Tu and McIsaac, 2002b; Harris, 2012
Personal Experience	PE	Independent Variables (IV)	Q. 8-15	P Esterhuyse, M Scholtz and Venter, 2016; Chou, Tu and Tsai, 2010; Huang, 2002; Drachsler and Kirschner, 2012
Digital Divide	DD	Independent Variables (IV)	Q. 24- 31	Richardson and Samara, 2021; Ferrari, 2012; Brown, 2018; Sosa Díaz, 2021
Study Intention	SI	Moderator Variables	Q. 32-36	Yu and Yang, 2005; Wei, Chen & Kinshuk, 2021; P Esterhuyse, M Scholtz and Venter, 2016; Badri et al., 2014
Learning Outcomes	LO	Dependent Variables (DV):	Q. 16-23	Sunkara and Kurra, 2017; Brahmasrene and Lee, 2012; Yu and Yang, 2005; Badri et al., 2014; P Esterhuyse, M Scholtz and Venter, 2016
Source: Illustrated by the author				

3.3.4.2 Population

The target population of this research is the learners who are 18 years of age or above and are in higher education institutions 1) enrolled / 2) will be enrolled / 3) have enrolled / 4) are ready to enrol in any course. According to statistics from the Hong Kong Census and Statistics Department, the population of this group is 6,390,000 (C&S Department, 2021).

3.3.4.3 Sampling Method

The snowball sampling and non-probability sampling methods will apply to the survey distribution. This method is widely used in situations where the population is unknown. This sampling technique can continue, just like the snowball increases, until the researcher has enough data to analyse. The results obtained can help researchers make wise decisions conclusively. (Frey, 2018).

3.3.4.4 Sampling Size

The sample size is a term used in market research to define the number of respondents included in the sample. By calculating the sample size, it is possible to know how many respondents need to be selected from the population to be considered sufficient to support the entire research. Usually, the sample size is supposed to represent the total population of the particular investigation (Bhalerao and Kadam, 2010).

This research sample size is based on the population scale to calculated, and the sampling frame is according to the HKSAR C&S Dept., the population size on age 18 or about is 6,390,000 (C&S Department, 2021).

Confidence Level using 95% ($Z=1.96$) is according to the probability that the sample accurately reflects the population's attitude. The industry standard is 95%. and the margin of error is 7%. So for this study, the sample size should be 196.

Table 3.3 shows the calculation of the sample size.

Table 3.3. Sample Size Calculation
The sample size (n) is calculated according to the formula: $n = \frac{z^2 * p * (1 - p) / e^2}{1 + (z^2 * p * (1 - p) / (e^2 * N))}$ Where: z = 1.96 for a confidence level (α) of 95%, p = proportion (expressed as a decimal), N = population size, e = margin of error. z = 1.96, p = 0.5, N = 6390000, e = 0.07 $n = \frac{1.96^2 * 0.5 * (1 - 0.5) / 0.07^2}{1 + (1.96^2 * 0.5 * (1 - 0.5) / (0.07^2 * 6390000))}$ $n = 196 / 1 = 195.994$ $n \approx 196$ The sample size (with finite population correction) is equal to 196 Source: goodcalculators.com, 2019

3.4 Relevant Methods for Data Analysis

This section will describe the methods and definitions used in subsequent data analysis and the process of predicting the credibility of the questionnaire by collecting a small number of responses after the questionnaire design is completed.

3.4.1 Data Analysis and Tools

This research will use SPSS statistical software for the quantitative data analysis. SPSS's full name is Statistical Package for Social Science, a powerful tool to help researchers analyse statistical data. The statistical analysis method is an indispensable tool for researchers to use quantitative research. In the past, statistical calculation formulas were complicated, and the amount of data was huge, making it difficult to apply statistical methods. However, with the vigorous development of computer systems, statistical software has become indispensable for data analysis. Analytical tools can assist researchers in establishing statistical analysis verification, interpreting the analysis results, and completing the complete base model for the description and interpretation of the results. The data analysis method can occur, including reliability and validity tests, descriptive statistics, inferential statistics, multiple linear regression and correlation.

3.4.2 Reliability

Reliability test refers to the reliability of measurement tools, such as correctness or accuracy, which means the stability and consistency of test results. In this study, Cronbach's coefficient is used as the reliability evaluation standard, and Cronbach's value should be greater than 0.7. The acceptable reliability is between 0.5 and 0.7, but less than 0.5 means that the reliability of the test is not good. Nunnally (1978) pointed the reliability of each construct is estimated to be more than 0.7, which means that each construct is reliable.

3.4.3 Validity

Validation can ensure the logical flow from analysis to the final result (Fowler, 2014). To achieve this goal, the scope of this research and the design of the questionnaire refers to 80 past research reports and journals in related or similar fields and use precise variable terms. However, each variable is obtained from the past literature. Since the variables in this study have been adopted by various researchers and related research reports have been published, they have shown good convergence and discrimination, effectiveness, and structural reliability. Therefore, there is no question of the validity of the scale.

3.4.4 Descriptive Statistics

Descriptive statistics is to simplify the data. When the researcher obtains a lot of messy data, it is difficult for ordinary people to understand the meaning hidden in the data without organising and calculating—using descriptive statistical methods to classify the data to emerge the critical information.

In this research, descriptive statistics are used to analyse the distribution of sample occurrences based on the learner's data variables, Social Presence, Personal Experience, Learning Outcomes, and Digital Divide to understand the distribution of sample occurrences in the questionnaire.

3.4.5 Inferential Statistics

Inferential statistics refers to how to infer the quantitative characteristics of the population based on sample data in statistics. It is based on the description of the sample data and makes inferences in the form of probability to the unknown quantity characteristics of the statistical population. More generally, it is inferred by observing a random process in a limited period. In statistics, statistical inference corresponds to descriptive statistics (Upton and Cook, 2011).

In this research, The results of statistical inference will be used to determine the correlation and provide a recommendation or to do more in-depth experiments or questionnaires or decide whether to implement in a future research plan.

3.4.6 Multiple Linear Regression and Correlation

Multiple linear regression analysis will be applied since this study has four independent variables and one return variable. Multiple linear regression is the most common form of regression analysis. Multiple linear regression describes data and explains the relationship between a dependent variable and two or more independent variables as predictive analysis. The core of multiple linear regression analysis is the task of fitting a line through a scatter plot (Hayes, 2020).

Multiple linear regression provides a line through a multidimensional data point cloud. The simplest form has one dependent variable and two independent variables. The general formula and calculation of Multiple Linear Regression are like Figure 3.6. And nowadays, a researcher can use SPSS to check whether there is a linear relationship between the independent and dependent variables in our multiple linear regression model (Statistics Solutions, 2021).

Figure 3.6. Formula and Calculation of Multiple Linear Regression

$$y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \dots + \beta_p x_{ip} + \epsilon$$

where, for $i = n$ observations:

y_i = dependent variable

x_i = explanatory variables

β_0 = y-intercept (constant term)

β_p = slope coefficients for each explanatory variable

ϵ = the model's error term (also known as the residuals)

Source: (Hayes, 2020)

3.5 Pre-test

The pre-test of the questionnaire is to check whether the questions are consistent. Its primary purpose is to delete questions with low reliability and use them as the basis for developing a formal questionnaire. (Bujang, Omar and Baharum, 2018) They suggest using 30 samples to measure reliability tests because the scale items have a strong correlation. Therefore, this test will use the first 30 response data to conduct this test to verify whether the reliability of the questionnaire can reach acceptance indicators (Cronbach's Alpha 0.7 or above). Table 3.4 shows the results of the test data. It was found that Nunnally (1978) reached Cronbach's coefficient to the recommended value above 0.7 and developed a structured questionnaire as the official questionnaire for this research.

Table 3.4. Result of Pre-Test Reliability			
Case Processing Summary			
		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0
a. Listwise deletion based on all variables in the procedure.			
Reliability Statistics			
		Cronbach's Alpha Based on Standardised Items	N of Items
Cronbach's Alpha		.905	36

3.6 Ethical Consideration

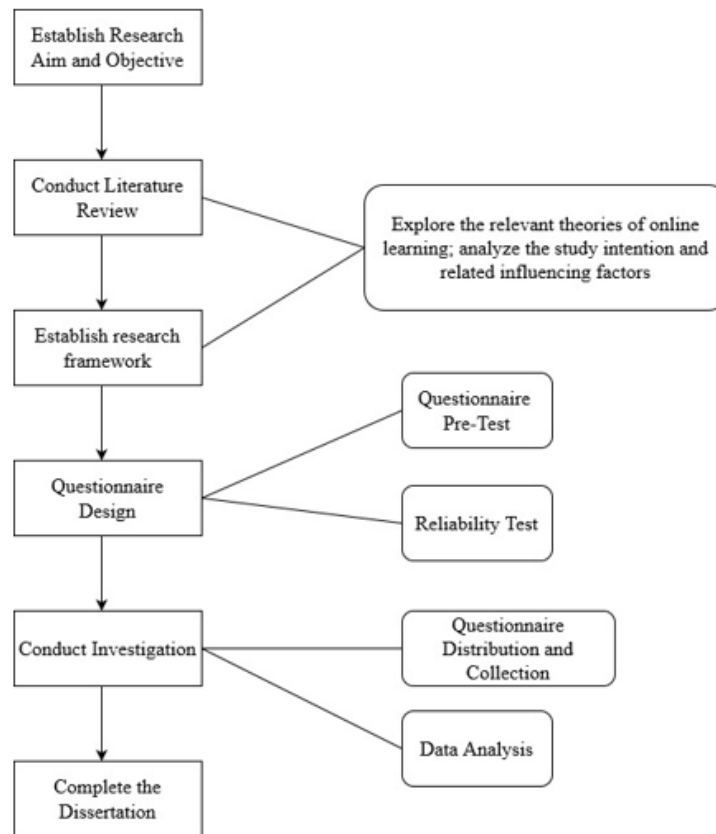
All participants have given informed consent to participate in this study. The questionnaire does not include any personal information or sensitive data, and the questionnaire data is collected through anonymous online surveys using Google Forms. All Participants are aged 18 or about and currently live in Hong Kong and study in Hong Kong high education institutions.

This research study did not involve any compensation, and participation is voluntary. Participants have the right to withdraw from the research or questionnaire at any time, without explanation. There will be no sanctions or penalties for refusing to participate or withdrawing from the study. All personal and experimental data will be kept confidential, and the survey results will be used for scientific research only.

3.7 Research Schedule

To determine the project's total time, researchers need to calculate the time required for each project, whether any activity depends on completing another, or whether part of the task can be achieved simultaneously. Therefore, a clear flow chart like Figure 3.7 allows researchers to conduct the research orderly.

Figure 3.7. Research Flow Chart



Source: Illustrated by the author

The Gantt chart displays each activity in the project as a time-limited line or bar chart, allowing researchers to see at a glance when and which tasks should be completed to complete the project on time. Identifying milestones or key milestones at this stage will aid the study.

Table 3.5. Gantt Chart															
		2021						2022							
		Oct	Oct	Nov	Nov	Dec	Dec	Jan	Jan	Feb	Feb	Mar	Mar	Apr	Apr
Week		1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
1	Research Proposal														
2	Literature Review														
3	Design Questionnaire														
4	Pre Test														
5	Send out Questionnaire														
6	Collect the data														
7	Data Analysis														
8	Write up research														
9	Finalise the research document														
Check Point • Prepare the survey question on Google Form by 3 Dec 2021 • Research proposal submitted by 13 Dec 2021 • Perform the pre-test with the first phase of 30 participants by 18 Dec 2021 • Collect the data from the Google Form and close the questionnaire by 10 Jan 2022 • Final dissertation submitted by 29 Apr 2022															
Source: Illustrated by the author															

CHAPTER 4: ANALYSIS AND RESULTS DISCUSSION

This chapter will summarize the data collected from the questionnaire, using SPSS software to perform relevant descriptive statistics, inferential statistics, correlation analysis and regression analysis, and check each data to prove whether each hypothesis is established.

4.1 Response Rate Analysis

The questionnaires of this research were collected from the internet through "Google Form", and the questionnaire responses were collected for one month from 1st December to 31st December 2021. According to the recommendations in chapter 3, the sample size was 196, and 216 questionnaires were finally collected. When the entire data was entered into SPSS, it was found that two of them were considered invalid (answers are all 1 and all 3). Since all the questions in this questionnaire are mandatory, the complete response in this questionnaire is 100%. Therefore, the adequate sample size is 214, and the response rate is 100%.

Table 4.1. Statistics of Respondents and Return Rate			
Total number of sampling size	Total number of questionnaires returned	Valid questionnaire	Return rate
196	216	214	100 %

Because this questionnaire uses snowball sampling and non-probability sampling methods, the proportion of data collected is more comprehensive, with average gender, age, occupation and education level. The detailed demographic information data will be shown in the next section.

4.2 Descriptive Statistics

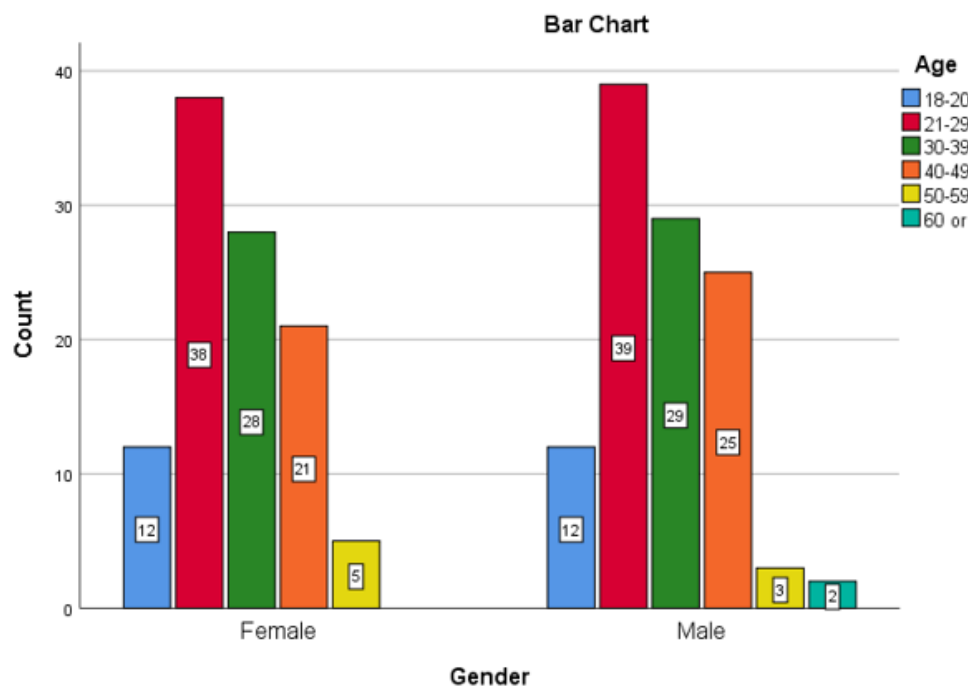
This subsection analyzes all descriptive statistics collected from "Part 1" of the questionnaire. The questionnaire was collected respondent demographic information. The data have consisted of 10 questions to describe gender, age, occupation, education level, how often use a computer, which electronic device has, online learning experience before or caused by the COVID-19 epidemic and which course type will take the online learning method.

4.2.1 Respondents Gender and Age Crosstabulation

Table 4.2 shows the respondent's Gender and Age Crosstabulation. The respondents of this survey are from 18 years old or above to 60 years old and above. The majority of respondents to this survey were 77 aged between 21 and 29, with 38 (49.4%) female and 39 (35.5%) male. The second group consisted of 57 people between 30 and 39, with 28 females (49.1%) and 29 males (50.9%). The third group consisted of 46 people between the ages of 40 and 49, with 21 females (45.7%) and 25 males (54.3%). The fourth group consisted of 24 people between 18 and 20, 12 (50%) female and 12 (50%) male. Finally, 10 people aged 50 to 59 and 60 years or older, 5 female (50%) and 5 male (50%).

Table 4.2. Respondents Gender and Age Crosstabulation

Gender * Age Crosstabulation									
			Age						
			18-20	21-29	30-39	40-49	50-59	60 or	Total
D1. Gender	Female	Count	12	38	28	21	5	0	104
		% within Gender	11.5%	36.5%	26.9%	20.2%	4.8%	0.0%	100.0%
		% within Age	50.0%	49.4%	49.1%	45.7%	62.5%	0.0%	48.6%
	Male	Count	12	39	29	25	3	2	110
		% within Gender	10.9%	35.5%	26.4%	22.7%	2.7%	1.8%	100.0%
		% within Age	50.0%	50.6%	50.9%	54.3%	37.5%	100.0%	51.4%
Total	Count	24	77	57	46	8	2	214	
	% within Gender	11.2%	36.0%	26.6%	21.5%	3.7%	0.9%	100.0%	
	% within Age	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

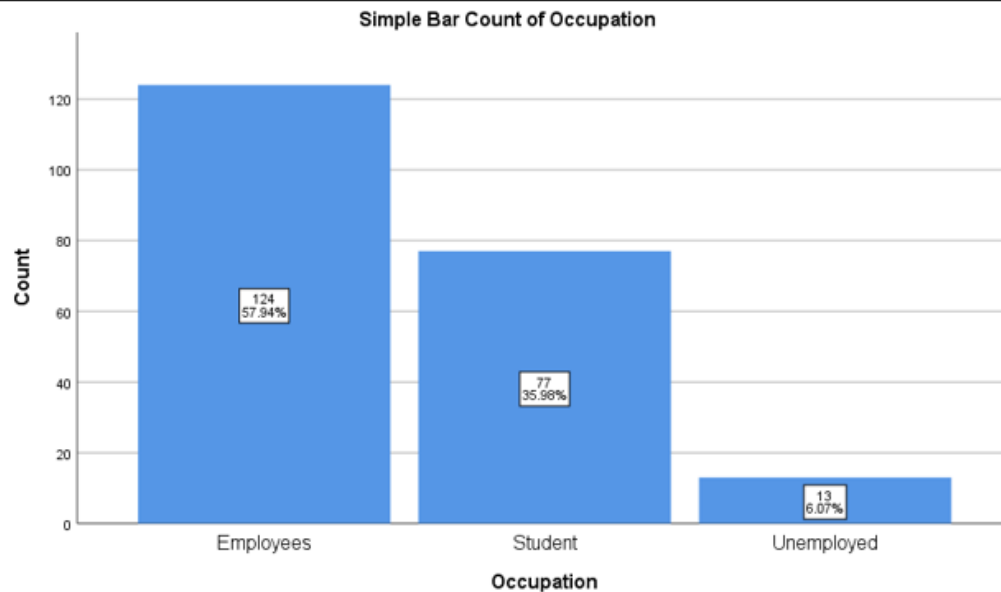


4.2.2 Respondents Occupation and Categories

Table 4.3 shows the respondents' occupation and occupation categories. A total of 214 respondents have 124 (57.95%) are employees, 77 (35.98%) are students, and 13 (6.07%) are unemployed.

Table 4.3. Respondents Occupation

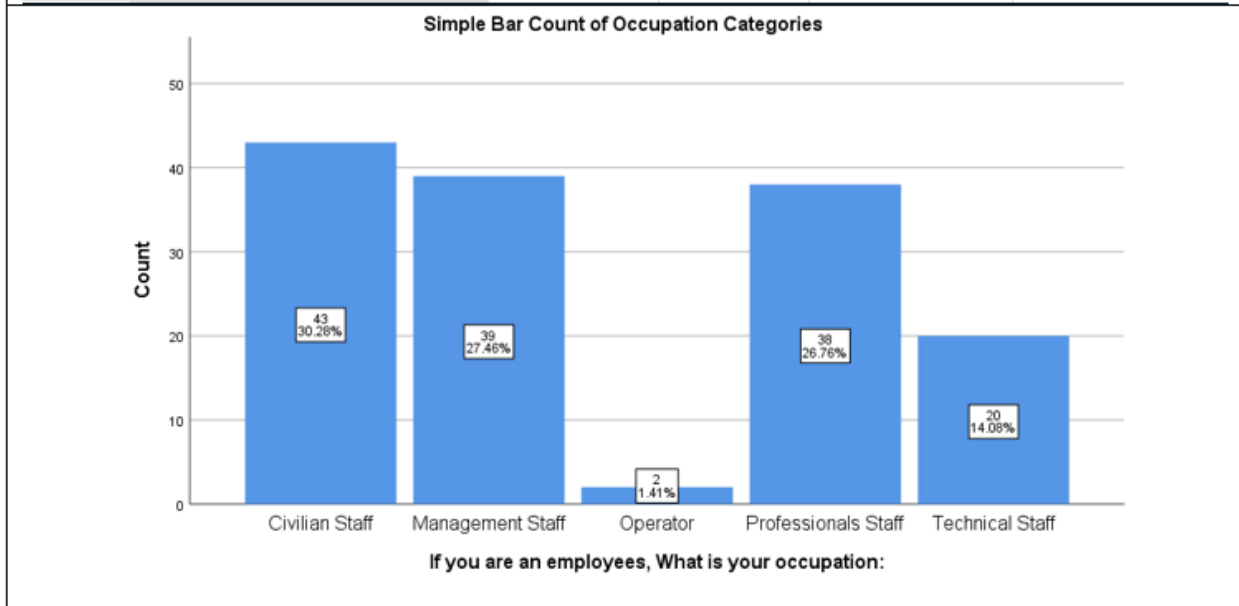
		Occupation			Cumulative Percent
		Frequency	Percent	Valid Percent	
Valid	Employees	124	57.9	57.9	57.9
	Student	77	36.0	36.0	93.9
	Unemployed	13	6.1	6.1	100.0
	Total	214	100.0	100.0	



However, among the 124 respondents, their job categories were as follows: Table 4.4: 72 were students, 43 were clerical staff, 39 were management staff, 2 were operators, 38 were professional staff, and 20 were technical staff.

Table 4.4. Respondents Occupation by Categories

		Type of occupation			Cumulative Percent
		Frequency	Percent	Valid Percent	
Valid	Students	72	33.6	33.6	33.6
	Civilian Staff	43	20.1	20.1	53.7
	Management Staff	39	18.2	18.2	72.0
	Operator	2	.9	.9	72.9
	Professionals Staff	38	17.8	17.8	90.7
	Technical Staff	20	9.3	9.3	100.0
	Total	214	100.0	100.0	



4.2.3 Respondents on Using Computer and Owned Devices

Table 4.5 shows the respondents how frequently they use computers and their owned computing devices. A total of 214 respondents, 195 respondents, were using a computer every day, 10 were using 2-3 times per week, 2 were once per week, 3 were less than once a month, 1 was once per month, and 3 were never used.

Table 4.5. Respondents on Using Computer and Owned Devices					
		Using Computer			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Every day	195	91.1	91.1	95.8
	2-3 times per week	10	4.7	4.7	4.7
	Less than once a month	3	1.4	1.4	97.2
	Never	3	1.4	1.4	98.6
	Once per month	1	.5	.5	99.1
	Once per week	2	.9	.9	100.0
	Total	214	100.0	100.0	

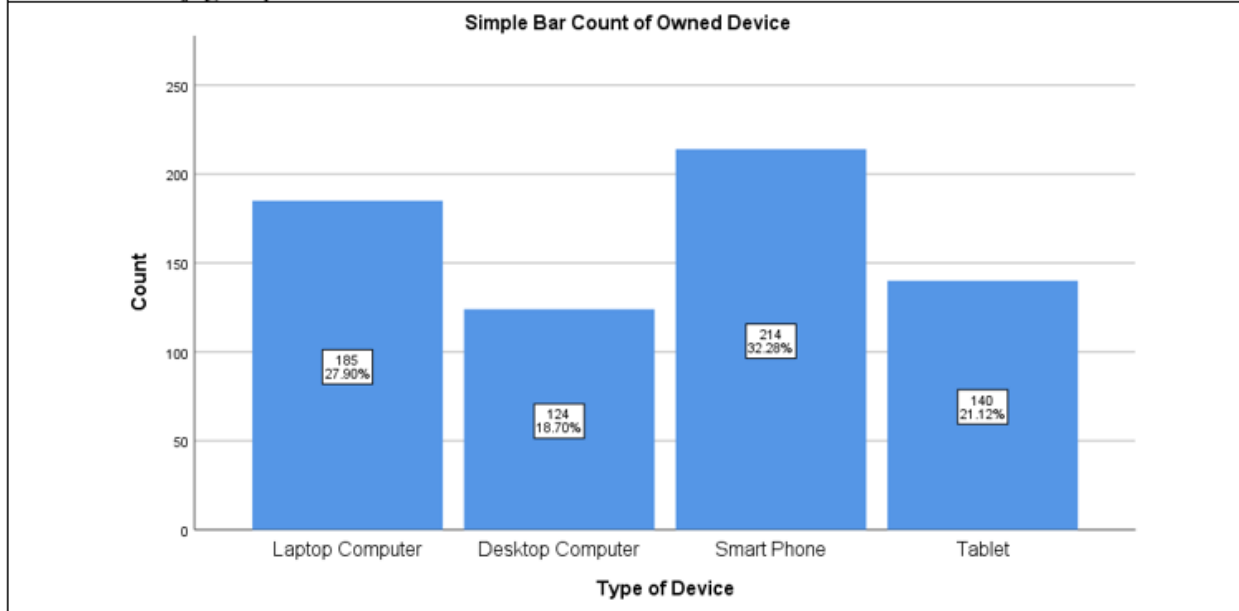
Regarding Table 4.5. 95.8% of respondents are most often using a computer daily. So the result assumes the respondents have essential computing operation skills.

Table 4.6 shows 124 owned a desktop computer, 185 owned a laptop computer, 140 owned a tablet computer, and all respondents owned a smartphone. It shows that there are more laptops than desktop computers and more tablets than desktop computers. It also shows the importance of the respondents to the convenience of equipment.

Table 4.6. Respondents on Owned Device

		Owned Electronic Devices		
		N	Percent	Percent of Cases
Own Device ^a	Desktop Computer	124	18.7%	57.9%
	Laptop Computer	185	27.9%	86.4%
	Tablet	140	21.1%	65.4%
	Smart Phone	214	32.3%	100.0%
Total		663	100.0%	309.8%

a. Dichotomy group tabulated at value 1.



Regarding Table 4.6. Most respondents own laptop computers and tablets more than desktop computers. The LMS developer can consider the platform design suitable for those devices in the future.

4.2.4 Respondents Experience in Online Learning

Table 4.7 shows 214 respondents who have had an online learning experience in or before 2021. 58 (27.1%) answered no, and 156 (72.9%) answered yes.

Table 4.7. Respondents on Experience in Online Learning					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	58	27.1	27.1	27.1
	Yes	156	72.9	72.9	100.0
	Total	214	100.0	100.0	

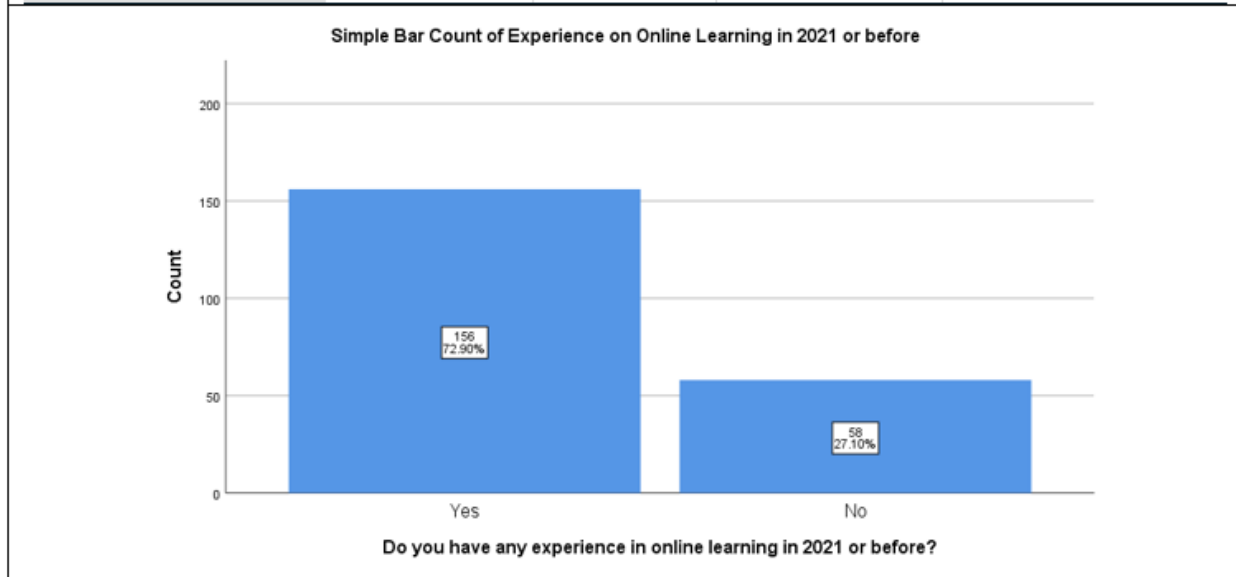
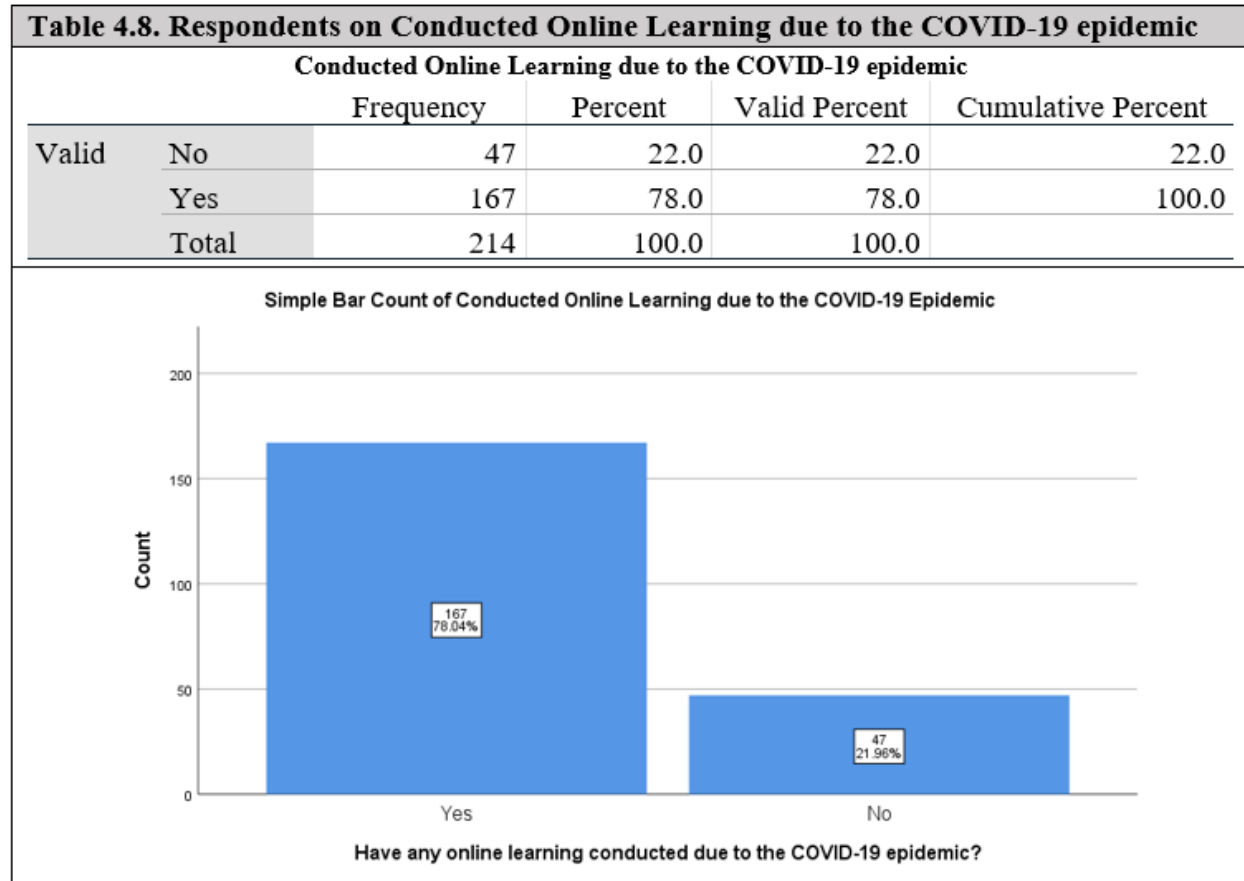


Table 4.8 shows that 167 respondents (78.04%) had conducted online learning due to the epidemic's impact, and 47 respondents did not have an online learning experience affected by the epidemic.



Regarding Table 4.7 and Table 4.8. Most respondents have online experience in or before this research period. The result can be assumed most of the respondents can accept or have expertise in online education. The educator and marketer can do more evaluation on this target group.

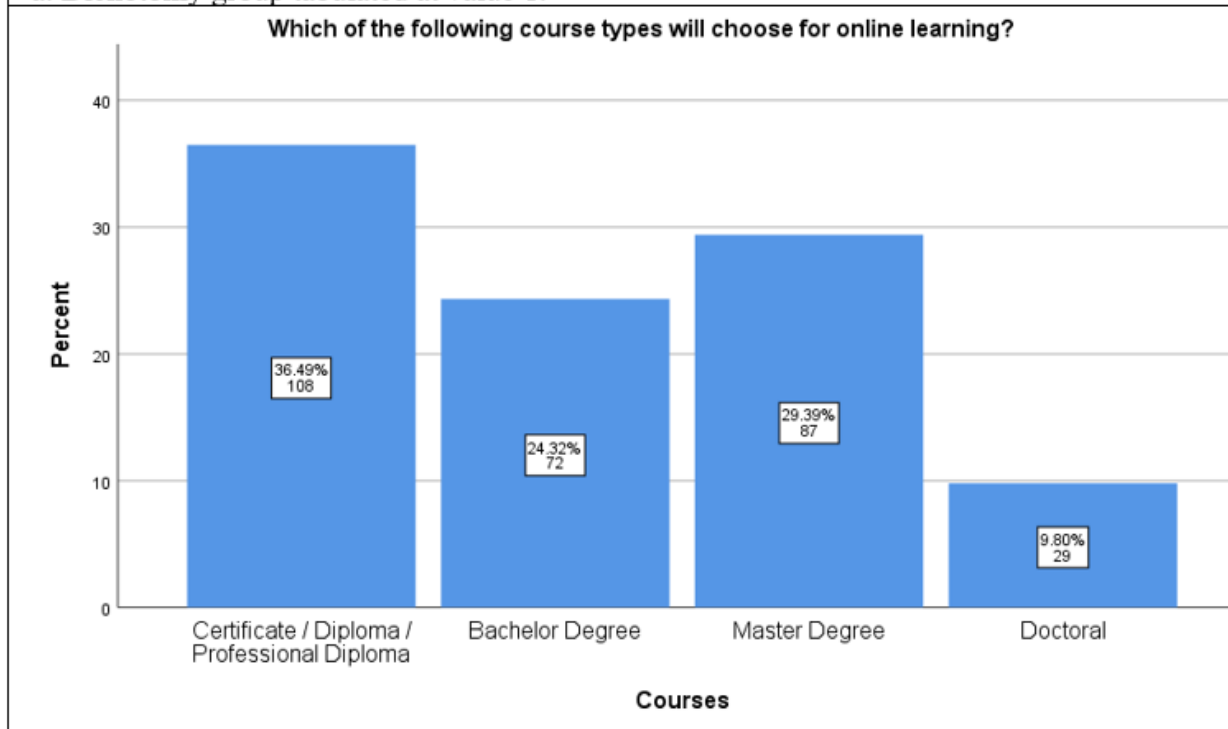
4.2.5 Respondents on course types will choose online learning

Table 4.9 shows that the respondents will select courses for online education in the future. The result shows the Certificate / Diploma / Professional Diploma kind of short period courses or programmes have 108 respondents selected, second is Master Degree have 87 chosen, third is Bachelor Degree have 72 chosen.

Table 4.9. Respondents on Selecting Courses for Online Learning

		Online Courses Frequencies		
		Responses		Percent of Cases
Type of Online Course ^a		N	Percent	
Certificate / Diploma / Professional Diploma		108	36.5%	50.5%
Bachelor Degree		72	24.3%	33.6%
Master Degree		87	29.4%	40.7%
Doctoral		29	9.8%	13.6%
Total		296	100.0%	138.3%

a. Dichotomy group tabulated at value 1.



4.2.6 Summary

In summary, 214 respondents were surveyed, 110 were males, and 104 were females; 30% were between 21 and 29. In terms of occupations, there are more employed persons than students, of which 124 are employed persons, 43 are engaged in clerical jobs, the second are managers and professionals with 39 and 38, and the remaining 77 are students. 13 persons and unemployed persons. More than 90% of the respondents habit using computers every day, and 185 own more notebook computers than desktop computers. Some of them also own Tablets at the same time, with 140. Among them, 156 respondents have had an online learning experience, and 167 people have conducted online learning due to the epidemic's impact. 108 of them will choose a certificate with a shorter course for the courses they want to study online in the future.

4.3 Inferential Statistics

This subsection continues the analysis of all data collected from "Parts 2-6" of the questionnaire. The questions are divided into five sections based on suggested variables, including Social Presence, Personal Experience, Digital Divide, Study Intention and Learning Outcomes. Reliability and validity analysis, correlation analysis and regression analysis were carried out for each variable.

4.3.1 Coding of Variables

To make it easy for readers to view and refer to the data in this study, the authors provide a code for each variable and group it by nature.

Table 4.10. Coding of Variables		
Variables	Code	Questions in the Data Set
Social Presence	SP	SP1 – SP7
Personal Experience	PE	PE1 – PE8
Digital Divide	DD	DD1 – DD8
Study Intention	SI	SI1 – SI5
Learning Outcomes	LO	LO1 – LO8

4.3.2 Reliability Validity Measurement

The "Cronbach α " coefficient created by Cronbach (1951) is a commonly used reliability test method in the Likert scale. A higher coefficient rate can represent internal consistency is better. For general research, the accepted value of the internal agreement is 0.8; if the reliability coefficient of any test or scale is above 0.9 to 0.8, the reliability of the test or scale is very credible. Table 4.11 shows the case processing summary listed total N is 214 with 100% valid responses. And the reliability on 36 questions Cronbach's Alpha is .920.

Table 4.11. Reliability Statistics Result for All Questions				
Case Processing Summary				Reliability Statistics
		N	%	
Cases	Valid	214	100.0	
	Excluded ^a	0	.0	
	Total	214	100.0	
a. Listwise deletion based on all variables in the procedure.				

Cronbach's Alpha	N of Items
.920	36

Table 4.12 shows that Cronbach's Alpha coefficients for each variable are equal to or greater than 0.7 is acceptable. However, the coefficients of Digital Divide, Learning Intention and Learning Outcomes are more significant than 0.8, so this group of items has a higher consistency and reliability. In the reliability analysis of various questionnaires, the coefficients are between 0.7 and 0.86, all above Cronbach's Alpha of 0.7, indicating that the reliability coefficients of different questionnaires are reliable and stable and can be used for further research.

Table 4.12. Reliability Statistics Result on Each Variable		
Variable Name	N of Items	Cronbach's Alpha
Social Presence	7	.730
Personal Experience	8	.700
Digital Divide	8	.832
Learning Intention	5	.801
Learning Outcomes	8	.868

In this study, the Kaiser-Meyer-Olkin (KMO) and Bartlett's were applied to measure sampling adequacy in SPSS. KMO and Bartlett's were used to determine the validity factor analysis (McCormick & Salcedo, 2017). The value ranges from 0 to 1, and Kaiser (1974) provided judgment criteria for KMO are as follows:

Table 4.13. KMO Judgment Criteria				
0 - 0.5	0.5 - 0.59	0.6 – 0.69	0.7 – 0.79	0.8 – 1.0
Unacceptable	Miserable	Ordinary	Medium	Excellent
Source: Kaiser, 1974				

Bartlett's sphere test is calculated by using correlation coefficients. Under normal circumstances, the value of the correlation matrix must be significantly greater than 0. Using SPSS software can check the significance of Bartlett's sphere test to determine whether it is suitable as a factorial test criterion. KMO is calculated using a net correlation matrix, and the significance of KMO and Bartlett's sphere test is 0.000 (Biasutti & Frate 2017). Table 4.14 shown the KMO is .869 (> 0.5) and the sig is .000 ($p < 0.05$). It shows that the data conforms to the standard, has a spherical distribution, and has a certain degree of independence between variables. The communalities of the research question are as follows, and the extraction is bounded between .484 to .844.

Table 4.14. KMO and Bartlett's Test and Communalities Data Set.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.869
Bartlett's Test of Sphericity	Approx. Chi-Square	4002.115
	df	630
	Sig.	.000

Communalities		
	Initial	Extraction
SP1. Learners from different social backgrounds participate in the learning together (such as differences in language, age, educational experience), which will affect your learning atmosphere.	1.000	.537
SP2. If an online learning platform can provide (including instant messaging, online discussion, online community functions), it can enhance your online communication opportunities.	1.000	.635
SP3. If the online learning platform can form a learning group or virtual academy, it can improve your online communication opportunities.	1.000	.631
SP4. You are willing to participate in online discussions or interact with other learners during online learning.	1.000	.707
SP5. Using other Computer-mediated communication (CMC) methods (such as WhatsApp, WeChat, telegram, etc.) to discuss or interact with other learners in the after-class time can enhance your interactivity.	1.000	.590
SP6. When you are studying online or conducting online discussions if you can hide your identity (for example, you don't need to use a camera lens or you only need to discuss in words), can you reduce embarrassment and increase participation.	1.000	.844
SP7. When you are studying online, if you can hide your identity, can you reduce your privacy concerns.	1.000	.795
PE1. When you are doing online learning, other learners will feel a lack of learning atmosphere when there is a lack of interaction or participation in discussions.	1.000	.497
PE2. An online learning platform can form a learning group or a virtual school, and you will become a part of it, enhancing your online learning intention.	1.000	.541
PE3. You will actively interact with other learners and teachers during online learning.	1.000	.603
PE4. You feel confident using an online learning platform or software without any assistance.	1.000	.584
PE5. When you encounter a problem using computer equipment, you will try to solve it yourself and ask for help.	1.000	.665
PE6. You are willing to try to carry out related activities through online learning.	1.000	.496
PE7. Online learning can provide a way to learn anytime, anywhere, and you can learn in any environment.	1.000	.684
PE8. If you have an independent, confidential environment for online learning, it will reduce stress and increase participation.	1.000	.524
LO1. Easy to operate the e-learning system (LMS) / online learning software (Zoom, Microsoft Teams, Blackboard collaborate) can enhance your learning effectiveness.	1.000	.699
LO2. Proficiency in using e-learning system (LMS) / online learning software (Zoom, Microsoft Teams, Blackboard collaborate) can improve your learning effectiveness.	1.000	.659
LO3. Obtaining all learning information through the online learning platform can help achieve learning results.	1.000	.624
LO4. Perceived using online learning can improve or enhance learning efficiency.	1.000	.555
LO5. A school with experience running online courses will enhance your choice of online learning.	1.000	.670
LO6. Teachers with online teaching experience will increase your intention to choose online learning.	1.000	.629
LO7. You have used e-learning to achieve your learning outcomes.	1.000	.484
LO8. Using e-learning helped me to improve my learning performance.	1.000	.659
DD1. Your digital capabilities can meet the needs of online learning.	1.000	.760
DD2. You have a habit of using electronic technology products frequently.	1.000	.781
DD3. You have a habit of using the internet to browse information frequently.	1.000	.766
DD4. If you have broadband Internet access at home, it can provide a stable network to enhance your motivation to choose online learning.	1.000	.618
DD5. Perceived using a desktop computer/notebook computer is more convenient than using a smartphone/tablet to conduct online learning.	1.000	.396
DD6. You or your family members have suitable and convenient electronic devices for online learning.	1.000	.688
DD7. Your family members have the skills to use electronic technology products and provide assistance to solve technical problems so that you can reduce the obstacles to online learning.	1.000	.679
DD8. If you do not have suitable electronic equipment, your family is willing to lend or buy equipment for you for online learning.	1.000	.739
IN1. You are willing to study in the same environment with people from different social backgrounds.	1.000	.664
IN2. You are willing to use online learning to replace other learning channels.	1.000	.709
IN3. Regardless of the learning effect. You are willing to choose online learning.	1.000	.718
IN4. If you don't feel electronic barriers, you are willing to treat online learning as a learning opportunity.	1.000	.675
IN5. In the future, you will consider choosing online learning courses.	1.000	.724

Extraction Method: Principal Component Analysis.

4.3.3 Correlation Analysis

The correlation analysis of this study will refer to the analysis method of Pearson Correlation, which uses the correlation coefficient (r) to measure the strength and weakness of the linear relationship between the two measurement variables to check whether there is a correlation between the variables. In correlation analysis, the coefficient is usually between -1 and 1 and represents the strength of the relationship (Ly et al., 2018). For this study, there are 2 relevant results as follows:

Table 4.15. Pearson Correlations on Social Presence (SP), Personal Experience (PE), Digital Divide (DD) and Study Intention (SI)

		Correlations			
		SP Average	PE Average	DD Average	SI Average
SP Average	Pearson Correlation	1	.594**	.428**	.395**
	Sig. (2-tailed)		.000	.000	.000
	N	214	214	214	214
PE Average	Pearson Correlation	.594**	1	.537**	.443**
	Sig. (2-tailed)	.000		.000	.000
	N	214	214	214	214
DD Average	Pearson Correlation	.428**	.537**	1	.369**
	Sig. (2-tailed)	.000	.000		.000
	N	214	214	214	214
SI Average	Pearson Correlation	.395**	.443**	.369**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	214	214	214	214

** . Correlation is significant at the 0.01 level (2-tailed).

Generally, researchers believe that a correlation of the coefficient scale below 0.3 is a low correlation, 0.3-0.5 is a moderate correlation, and above 0.5 is a high correlation, so the results of this study can be presumed to be a high correlation between the two variables (Laerd Statistics, 2018). Table 4.15. lists the Pearson Correlations for Social Presence (SP), Personal Experience (PE), Digital Divide (DD) and Study Intention (SI). The coefficient between Social Presence and Study Intention is ($r = 0.395$, $p < 0.05$), representing a positive and moderately correlation. Second, the coefficient between Personal Experience and Study Intention is ($r = 0.443$, $p < 0.05$),

representing a positive and moderate correlation. Third, Digital Divide and Study Intention coefficient is ($r = 0.369$, $p < 0.05$), representing a positive correlation and a moderate correlation. The p-values are an important indicator. When the values are 0.00 (less than 0.01), the correlation is statistically significant if less than 0.05 level is still acceptable (Schober et al., 2018).

Also, Table 4.16. shown the Pearson Correlations of the coefficient between Study Intention (SI) and Learning Outcomes (LO) is ($r = 0.579$, $p < 0.05$), representing a positive and high correlation.

Table 4.16. Pearson Correlations on Study Intention (SI) and Learning Outcomes (LO)			
Correlations			
		SI Average	LO Average
SI Average	Pearson Correlation	1	.579**
	Sig. (2-tailed)		.000
	N	214	214
LO Average	Pearson Correlation	.579**	1
	Sig. (2-tailed)	.000	
	N	214	214
**. Correlation is significant at the 0.01 level (2-tailed).			

4.3.4 Regression Analysis

Regression analysis is a method of statistically analyzing data to understand whether two or more variables are correlated, the direction and strength of the correlation, and to build mathematical models that observe specific variables to predict variables of interest to researchers. Regression analysis can help people understand how much the dependent variable changes when only one independent variable changes (Gallo, 2015).

4.3.4.1 Regression Model on Social Presence (SP), Personal Experience (PE), Digital Divide (DD) to Study Intention (SI)

Table 4.17 is shown the regression model analysis with the entering method used to predict where Social Presence, Personal Experience, Digital Divide are independent variables, and Study Intention is the dependent variable. The correlation coefficient R at this regression modulus is 0.490, indicating a positive linear relationship. Additionally, the R-squared is 0.240, and the adjusted R-squared is 0.229, meaning that 22.9% of the Study Intention variation can pass through perceived value. The ANOVA table *explained a variance* in Study Intention, $F(3,210) = 213$, $P < 0.001$, $R^2 = .240$, adjusted $R^2 = .229$. In Sig, the p-value is 0.000, which is less than 0.05, there is a significant relationship between the independent and dependent variables in the regression model (Tarlow, 2015).

Table 4.17. Regression Model on Social Presence, Personal Experience, Digital Divide and Study Intention

Model Summary ^b									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.490 ^a	.240	.229	.66505	.240	22.117	3	210	.000
a. Predictors: (Constant), Digital Divide Average, Social_Presence Average, Personal Experience Average									
b. Dependent Variable: Study Intention Average									

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.347	3	9.782	22.117	.000 ^b
	Residual	92.881	210	.442		
	Total	122.228	213			
a. Dependent Variable: Study Intention Average						
b. Predictors: (Constant), Digital Divide Average, Social_Presence Average, Personal Experience Average						

The multiple regression coefficient reports on Table 4.18 predicts Social Presence, Personal Experience, and Digital Divide to Study Intention. The value of SP Average is 0.020, PE Average is 0.002, and DD Average is 0.031. All three variables' sig values (P-values) is less than the statistical definition of 0.05 (Sato-Ilic, 2017). Therefore, this coefficient has significantly correlated and reliable.

Table 4.18. Regression Coefficients on of Social Presence, Personal Experience, Digital Divide and Study Intention

Model	Coefficients ^a					Correlations			Collinearity Statistics	
	Unstandardized Coefficients		Standardized Coefficients		Sig.	Zero-order	Partial	Part	Tolerance	VIF
	B	Std. Error	Beta	t						
1 (Constant)	.519	.411		1.264	.208					
SP Average	.224	.096	.177	2.340	.020	.395	.159	.141	.630	1.587
PE Average	.377	.121	.253	3.121	.002	.443	.211	.188	.549	1.820
DD Average	.207	.095	.157	2.174	.031	.369	.148	.131	.694	1.442

a. Dependent Variable: Study Intention Average

In addition, by definition, the VIF value should be equal to or greater than 1 and less than 10. If the VIF value exceeds 4 it needs to have further investigation. When it exceeds 10, there is an obvious collinearity problem. (Akinwande, Dikko and Samson, 2015). In this study, Social Presence is 1.587, Personal Experience is 1.820, and Digital Divide is 1.442. Therefore, the VIF value is acceptable.

Figure 4.1 shows the scatter plot used to observe relationships between three independent variables (SP, PE, DD) and the dependence variable (SI). When a scatter plot is used to see predictions or correlations between variables, a trend line is usually added to show the mathematical best fit to the data. (Restori, 2018). According to figure 4.1, the trend line is sloping in a positive direction, meaning a strong positive relationship between the two variables.

Figure 4.1. Scatter Plot of each independence variable to Study Intention

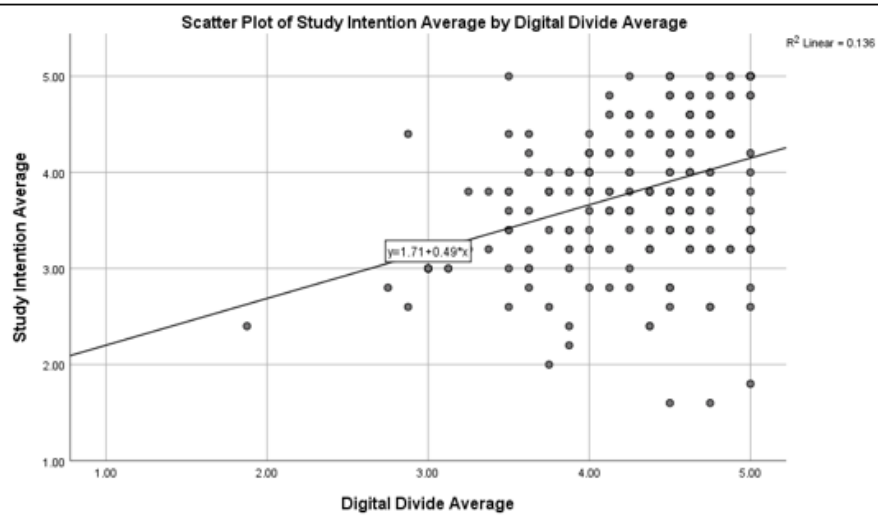
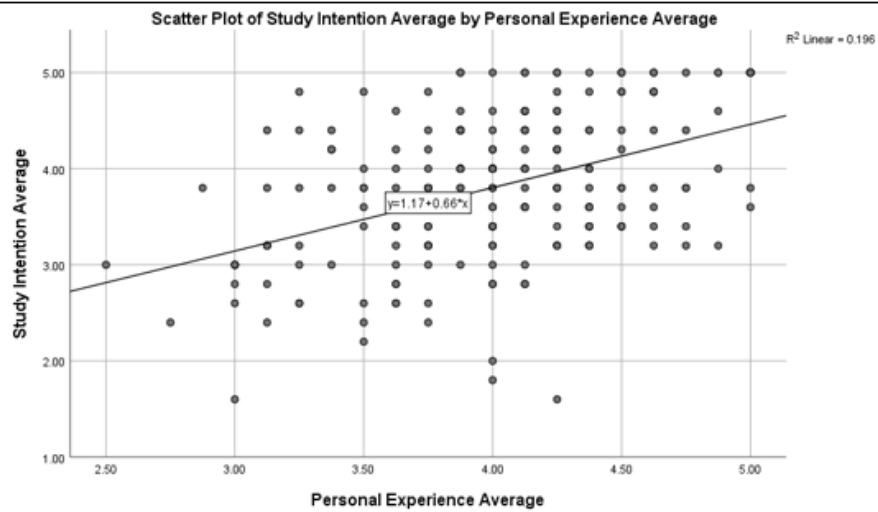
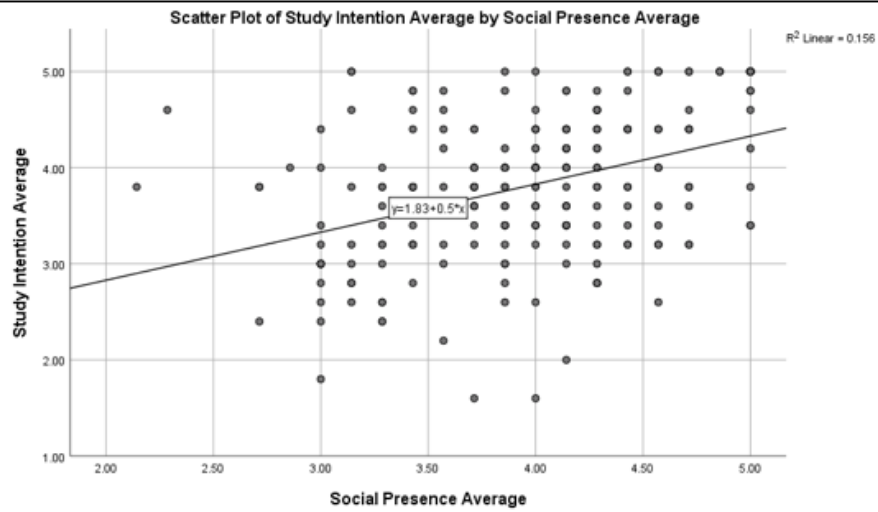


Table 4.19 shows the collinearity diagnostics attempts to extract uncorrelated dimensions from variable data. Data shows the condition index is between 18 to 24. Kim, Fox and Monette (1992, 2019) stated that the CI number between 10 and 30 is indicated as multicollinearity. If the CI is over 30 means has serious multicollinearity problems. However, the CI value of this study was not out of specification. So there is no collinearity problem.

Table 4.19. Collinearity Diagnostics on of Social Presence, Personal Experience, Digital Divide and Study Intention

Collinearity Diagnostics ^a							
Model	Dimension	Eigenvalue	Condition Index	(Constant)	Variance Proportions		
					Social Presence Average	Personal Experience Average	Digital Divide Average
1	1	3.973	1.000	.00	.00	.00	.00
	2	.012	18.030	.17	.71	.00	.21
	3	.009	21.288	.76	.00	.01	.62
	4	.006	24.763	.07	.29	.99	.18

a. Dependent Variable: Study Intention Average

In addition, the residual statistics are shown in Table 4.20. The residuals are distributed as an average constant and will not be affected by dividing the predicted value. According to the statistics below, the minimum residual value is -2.28628, the maximum is 1.38318, and the standard deviation is .66035.

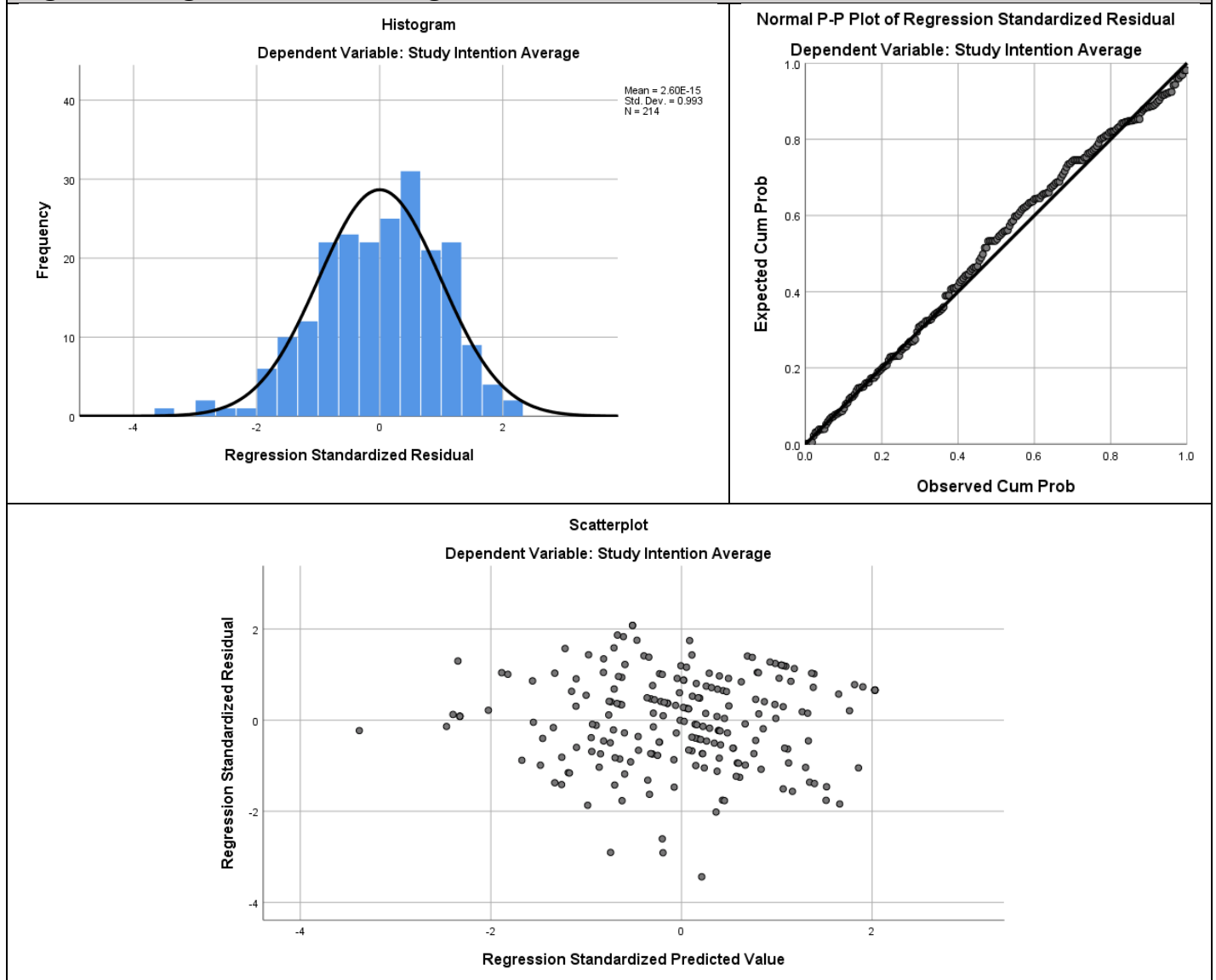
Table 4.20. Residuals Statistics on Study Intention

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.5527	4.5609	3.8075	.37119	214
Residual	-2.28628	1.38318	.00000	.66035	214
Std. Predicted Value	-3.381	2.030	.000	1.000	214
Std. Residual	-3.438	2.080	.000	.993	214

a. Dependent Variable: Study Intention Average

Figure 4.2 shows the histogram of the regression model, where the standardized regression residuals are normally distributed, indicating a positive (+) and linear relationship. The "scatter plot" shows the distribution of residuals and the distribution without normality, which means the variables are independent and unrelated to other data.

Figure 4.2. Regression Model Histograms and Scatter Plots



4.3.4.2 Summary of Regression on Social Presence (SP), Personal Experience (PE), Digital Divide (DD) to Study Intention (SI)

Based on the above analysis, the equation (Bryan-Jones et al., 1983) of Social Presence (SP), Personal Experience (PE), Digital Divide (DD) to Study Intention (SI) Linear Regression model is as follow: $SI = 0.519 + 0.224 (SP) + 0.337 (PE) + 0.207(DD)$

Figure 4.3. Equation of Regression Analysis

$$\hat{Y} = a + b_1X_1 + b_2X_2 + ... + b_nX_n$$

Source: Bryan-Jones et al., 1983

Multiple regression using the Enter method was used to predict learner performance in Social Presence (SP), Personal Experience (PE), Digital Divide (DD) and Study Intention (SI). The model explained Study Intention $F(3,210) = 213$, $P < 0.001$, $R^2 = .240$, adjusted $R^2 = .229$. Personal Experience was a significant predictor, $\beta = .253$, $t(210) = 3.121$, $p = 0.002$. Second is Social Presence, $\beta = .177$, $t(210) = 2.340$, $p = 0.020$. Last is Digital Divide, $\beta = .157$, $t(210) = 2.174$, $p = 0.031$. Due to various factors p-values are all less than 0.05, so H1, H2, and H3 are accepted and show a significant correlation.

4.3.4.3 Regression Model on Study Intention (SI) to Learning Outcomes (LO)

Table 4.21 is shown the regression model analysis with the entering method used to predict where Study Intention is the independent variable and Learning Outcomes is the dependent variable. The correlation coefficient R at this regression modulus is 0.579, indicating a positive linear relationship. Additionally, the R-squared is 0.335, and the adjusted R-squared is 0.332, meaning that 33.2% of the Study Intention variation can pass through perceived value. The ANOVA table *explained a variance* in Learning Outcomes, $F(1,212) = 213$, $P < 0.001$, $R^2 = .335$, adjusted $R^2 = .332$. In Sig, the p-value is 0.000, which is less than 0.05. There is a significant relationship between the independent and dependent variables in the regression model (Tarlow, 2015).

Table 4.21. Regression Model on Study Intention and Learning Outcomes					
Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	
1	.579 ^a	.335	.332	.52570	
a. Predictors: (Constant), Study Intention Average					
b. Dependent Variable: Learning Outcomes Average					

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29.497	1	29.497	106.734	.000 ^b
	Residual	58.588	212	.276		
	Total	88.085	213			
a. Dependent Variable: Learning Outcome Average						
b. Predictors: (Constant), Study Intention Average						

The regression coefficient report (Table 4.22) shows the significance of Study Intention to Learning Outcomes. The value of the SI Average is 0.000, and LO Average is 0.000. All 2 variables' sig values (P-values) is less than the statistical definition of 0.05 (Sato-Ilic, 2017). Therefore, this coefficient has significantly correlated and reliable.

Table 4.22. Regression Coefficients on Study Intention and Learning Outcomes

Model	Coefficients ^a		t	Sig.	Collinearity Statistics	
	Unstandardized Coefficients	Standardized Coefficients			Tolerance	VIF
	B	Std. Error	Beta			
1 (Constant)	2.055	.185		11.132	.000	
Study Intention Average	.491	.048	.579	10.331	.000	1.000

a. Dependent Variable: Learning Outcomes Average

In addition, by definition, the VIF value should be equal to or greater than 1 and less than 10. If the VIF value exceeds 4 it needs to have further investigation. When it exceeds 10, there is an obvious collinearity problem. (Akinwande, Dikko and Samson, 2015). In this study, the intention to learn was 1.000. Therefore, VIF values are acceptable.

Figure 4.4 shows the scatter plot used to observe relationships between mediating variables (Study Intention) and the dependence variable (Learning Outcomes). When a scatter plot is used to see predictions or correlations between variables, a trend line is usually added to show the mathematical best fit to the data. (Restori, 2018). According to figure 4.4, the trend line is sloping in a positive direction, which means a strong positive relationship between the two variables.

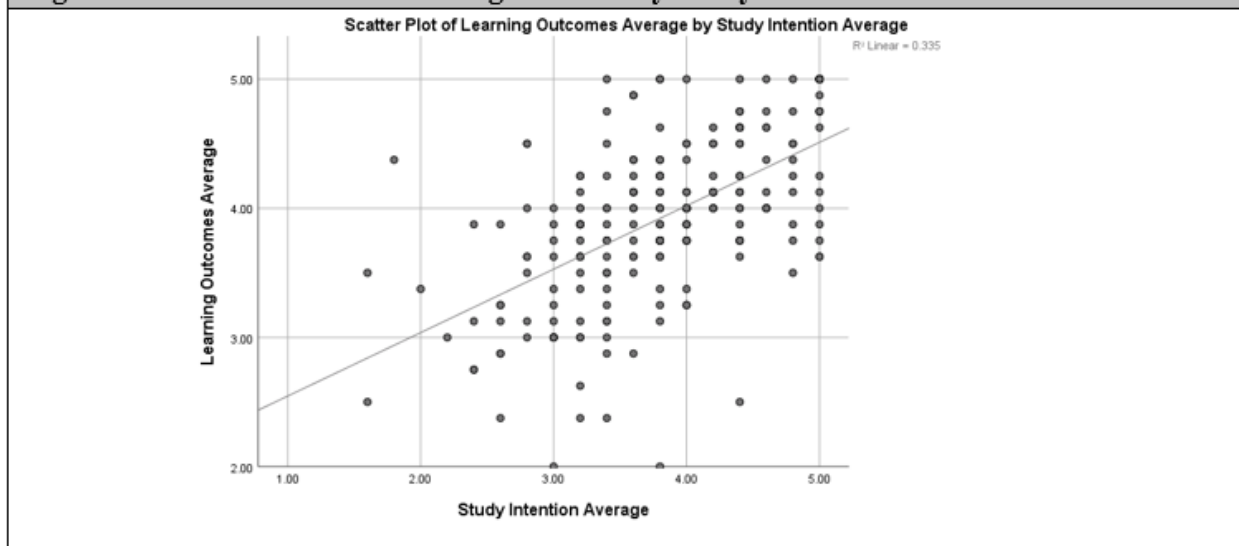
Figure 4.4. Scatter Plot of Learning outcome by Study Intention

Table 4.23 shows the collinearity, and the analysis attempts to extract uncorrelated dimensions from variable data. Data shows the condition index is between 1 to 10. Kim, Fox and Monette (1992, 2019) stated that the CI number between 10 and 30 is indicated as multicollinearity. If the

CI is over 30 means has serious multicollinearity problems. However, the CI value of this study was not out of specification. So there is no collinearity problem.

Table 4.23. Collinearity Diagnostics on Study Intention and Learning Outcomes

Model	Dimension	Eigenvalue	Collinearity Diagnostics ^a		
			Condition Index	(Constant)	Variance Proportions Study Intention Average
1	1	1.981	1.000	.01	.01
	2	.019	10.174	.99	.99

a. Dependent Variable: Learning Outcomes Average

In addition, the residual statistics are shown in Table 4.24. The residuals are distributed as an average constant and will not be affected by dividing the predicted value. According to the statistics below, the minimum residual value is -1.92156, the maximum is 1.43594, and the standard deviation is 0.52446.

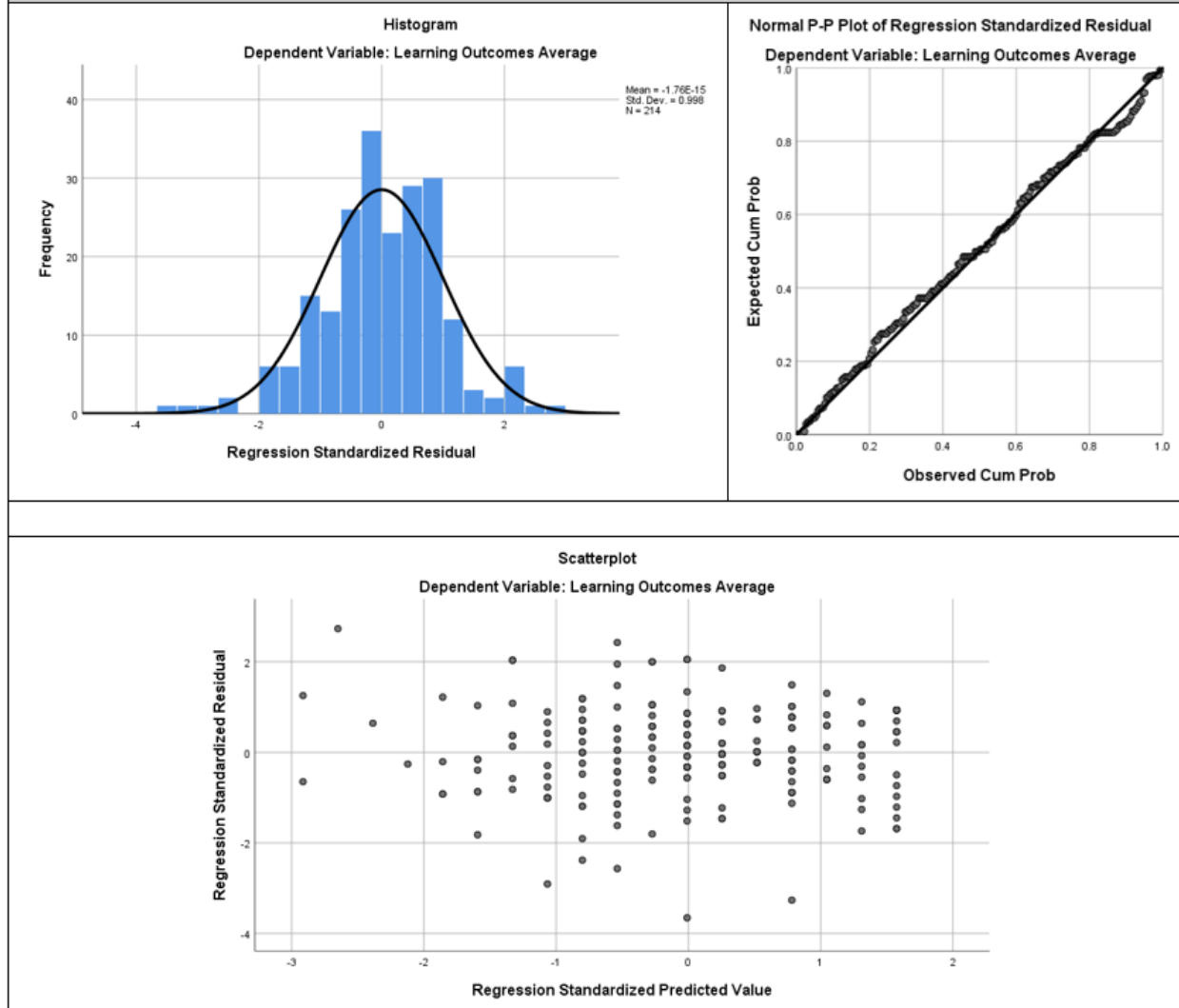
Table 4.24. Residuals Statistics on Learning Outcomes

	Residuals Statistics ^a				
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.8408	4.5111	3.9252	.37213	214
Residual	-1.92156	1.43594	.00000	.52446	214
Std. Predicted Value	-2.914	1.574	.000	1.000	214
Std. Residual	-3.655	2.731	.000	.998	214

a. Dependent Variable: Learning Outcomes Average

Figure 4.5 shows the histogram of the regression model, where the standardized regression residuals are normally distributed, indicating a positive (+) and linear relationship. The "scatter plot" shows the distribution of residuals and the distribution without normality, which means the variables are independent and unrelated to other data.

Figure 4.5. Regression Model Histograms and Scatter Plots



4.3.4.4 Summary of Regression on Study Intention (SI) to Learning Outcomes (LO)

Based on the above analysis, the equation (Bryan-Jones et al., 1983) of the Study Intention (SI) to Learning Outcomes (LO) Linear Regression model is as follow: $LO = 2.055 + 0.491 (SI)$

Figure 4.3. Equation of regression analysis

$$\hat{Y} = a + b_1X_1 + b_2X_2 + \dots + b_nX_n$$

Source: Bryan-Jones et al., 1983

Multiple regression using the enter method was used to predict learner performance in Study Intention to Learning Outcomes, followed by Study Intention. The model explained Learning Outcomes, $F(1,212) = 213$, $P < 0.001$, $R^2 = .335$, adjusted $R^2 = .332$. Study Intention was a significant predictor, $\beta = .579$, $t(212) = 10.331$, $p < 0.001$. Due to factors p-values is less than 0.05, indicating that H4 is accepted and show a significant correlation.

4.4 Discussion and Results

Based on the above analysis, it can be seen from the predictor value (p-value) between each independent (Social Presence, Personal Experience, Digital Divide) and dependent (Study Intention). All p-value is less than 0.05, indicating a significant positive relationship. Therefore, the analysis results in Table 4.25 show that each hypothesis is supported.

Table 4.25. Result of a Hypothesis Test (H1, H2, H3)

Hypothesis (coding)	Coefficients	Sig. (p-value)	Analysis results
H1: SP → SI	0.224	0.020	Support
H2: PE → SI	0.377	0.002	Support
H3: DD → SI	0.207	0.031	Support

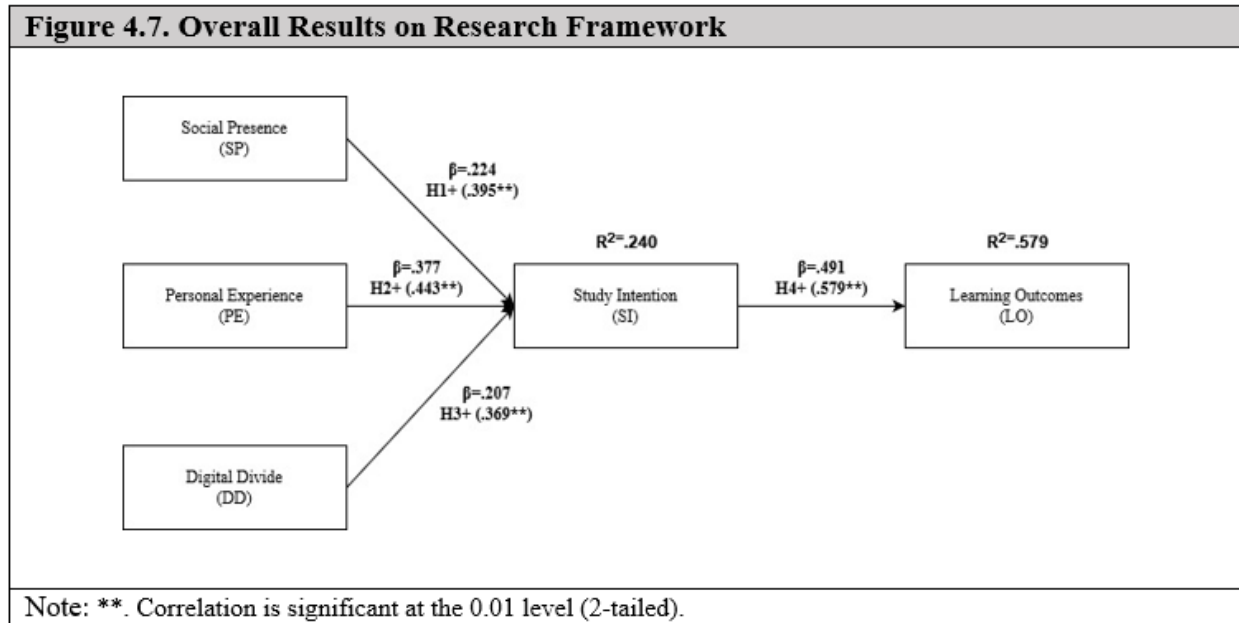
Since this study used a 3-1-1 research model, it was necessary to look at the predictor value (p-value) between another set of mediating (Study Intention) and dependent (Learning Outcomes) variables. The analysis results from Table 4.26 show that the p-value is less than 0.05. Hence there is a significant positive relationship, and this hypothesis is supported.

Table 4.26. Result of a Hypothesis Test (H4)

Hypothesis (coding)	Coefficients	Sig. (p-value)	Analysis results
H4: SI → LO	0.491	0.000	Support

According to the above analysis results, it shows that each variable is significant. Therefore, Table 4.27 proposed hypotheses are established and accepted, and Figure 4.7 shows the overall results of the research framework.

Table 4.27. Proposed Hypotheses	Decision
H1: Social Presence and Study Intention have a significant relationship.	Accepted
H2: Personal Experience and Study Intention have a significant relationship.	Accepted
H3: Digital Divide and Study Intention have a significant relationship.	Accepted
H4: Study Intention and Learning Outcomes have a significant relationship.	Accepted



CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

Based on the research results of Chapters 1 to 4 above, this chapter draws the research conclusions and puts forward relevant suggestions for the school, teachers and online learning platform service designers. A further analysis was performed on the data provided by the researchers for reference.

5.1 Conclusion

In conclusion, this research proposes appropriate analysis and research directions for learners' intention for online learning, from Social Presence, Personal Experience, Digital Divide and Learning Outcomes. Data collection to understand learners' intentional factors for improving online education, comparing social experience, personal experience, digital divide and learning Outcomes relationship. The conclusions of the study are summarized as follows:

Table 5.1. Overall Decision on Hypothesis Testing	Decision
H1: Social Presence and Study Intention have a significant relationship.	Accepted
H2: Personal Experience and Study Intention have a significant relationship.	Accepted
H3: Digital Divide and Study Intention have a significant relationship.	Accepted
H4: Study Intention and Learning Outcomes have a significant relationship.	Accepted

5.1.1 Result of Hypothesis Testing H1

Social presence can influence learners' intention from the following aspects. For social context, more than 153 (98 Agree and 55 Strongly Agree) respondents believe that Learners from different social backgrounds and characteristics participating in the learning together (such as differences in language, age, educational experience) will affect the learning atmosphere. For interactivity, most of the respondents (97 Agree and 60 Strongly Agree) agree that online communication and online interactive instant messaging have a specific role in online learning if interactive instant messaging is added to a virtual classroom. In addition, using CMC communication software after class can strengthen the communication between students, thereby enhancing the intention of online learning. For privacy, learners are concerting their identity when conducting online discussions. Respondents (64 Agree and 90 Strongly Agree) agree that they don't need to use a camera lens or use text to discuss can reduce embarrassment and increase participation during the online class.

So the H1 hypotheses can support (Sung and Mayer, 2012). Tu and McIssac (2002) and Yen and Tu (2011) suggested four dimensions of social presence in the social context, online communication, interactivity, and privacy.

5.1.2 Result of Hypothesis Testing H2

Personal experience can influence learners' intention from the following aspects. For lack of community, respondents (73 Agree and 83 strongly agree) believe that the lack of interaction or participation in discussions during online learning will affect the learning atmosphere. Second, learners (95 Agree and 56 Strongly Agree) agree that online learning platforms can form a learning group, or virtual schools can enhance online learning intention. For Learner characteristics, respondents (71 Agree and 42 Strongly Agree) are willing to interact with learners, and teachers can enhance the learning experience during online learning. But the result of 63 respondents chose neutral, meaning that some learners are passive. Most of the respondents (88 Agree and 102 Strongly Agree) can solve the technical problem by themselves and are confident using an online learning platform or software without any assistance. For the learning environment, Respondents (76 Agree and 87 Strongly Agree) agree that having an independent environment for online learning can reduce stress and increase participation. And respondents (86 Agree and 80 Strongly Agree) agree that online learning can provide a way to learn anytime, anywhere, and in any environment. So the H2 hypotheses can support Song et al. (2004), Howland and Moore (2002), Clark (2002), Dwyer (2003), and Song et al. (2004) suggested four dimensions of Personal experience in lack of community, learner characteristics, technical problems, and learning environment.

5.1.3 Result of Hypothesis Testing H3

Digital Divide can influence learners' intention from the following aspects. Digital citizens can judge from respondents whether they can participate actively, critically and competently in the digital environment. It can be seen from the replies that the respondents have the habit of frequently using electronic technology products (60 Agree and 137 Strongly Agree) and using the internet (53 Agree and 142 Strongly Agree) to browse information. It reflects that the respondents belong to the category of digital citizens. In digital competence, respondents (81 Agree and 106 Strongly Agree) felt that their digital abilities could meet online learning needs. And digital skills also drive learners to improve in technology access. In addition, family support is also critical, which is that

the family can have stable broadband internet access (64 Agree and 115 Strongly Agree). Family members have suitable electronic equipment (66 Agree and 114 Strongly Agree) or are willing to lend or purchase equipment (74 Agree and 85 Strongly Agree) for learners to use for online learning can increase intention. So the H3 hypotheses can support Law (2021), Council of Europe (2021), Institute for Prospective Technological Studies Joint Research Centre and Ferrari (2012), Brown (2018) and Sosa Díaz (2021) suggested four dimensions of the digital divide in digital citizenship, digital competence, technology access and family support.

5.1.4 Result of Hypothesis Testing H4

Learning Outcomes can influence learners' intention from the following aspects. The effectiveness of online learning is easily affected by many elements. Respondents (87 Agree and 86 Strongly Agree) believe that perceived ease of use of the e-learning system (LMS) and online learning software and have to experience (86 Agree and 88 Strongly Agree) in using e-learning system (LMS) / e-learning software can improve learning effectiveness. In addition, learners believe (109 Agree and 56 Strongly Agree) that if the school can provide a learning platform for students to obtain all learning information, it can also help achieve learning outcomes. In addition, teachers with online teaching experience (97 Agree and 70 Strongly Agree) can enhance learners' intention to choose online learning.

In addition, it must be noted that e-learning can improve or enhance learning efficiency. Whether schools have experience running online courses and whether e-learning can help improve academic performance is relatively polarized. Some respondents expressed neutrality. Therefore, the school has experienced in running online courses. Although there were 85 Agree and 52 Strongly Agree respondents, 55 respondents answered Neutral at the same time. The same is true for online learning to improve or enhance learning efficiency (94 Agree, 34 Strongly Agree and 55 Neutral). The same is true of whether e-learning can help improve academic performance (73 Agree, 51 Strongly Agree and 67 Neutral). This situation reflects that learners must have experienced the online learning process and be satisfied with online learning to quantify the learning outcomes. Although learning outcomes have two polarities on learning intention, there is still a significant positive correlation. So the H4 hypotheses can support Khadija Alhumaid (2020a), Akyüz and Samsa (2009), and Jung et al. (2002) suggested four dimensions of the learning

outcomes in perceived ease of use, perceived usefulness, course content and design and learner characteristics.

5.2 Recommendations

Through the results of this research, it has been shown that social presence, personal experience, digital gap, and learning achievement can all impact learning motivation. We will make recommendations for various stakeholders on improving learning intention for online learning among multiple factors.

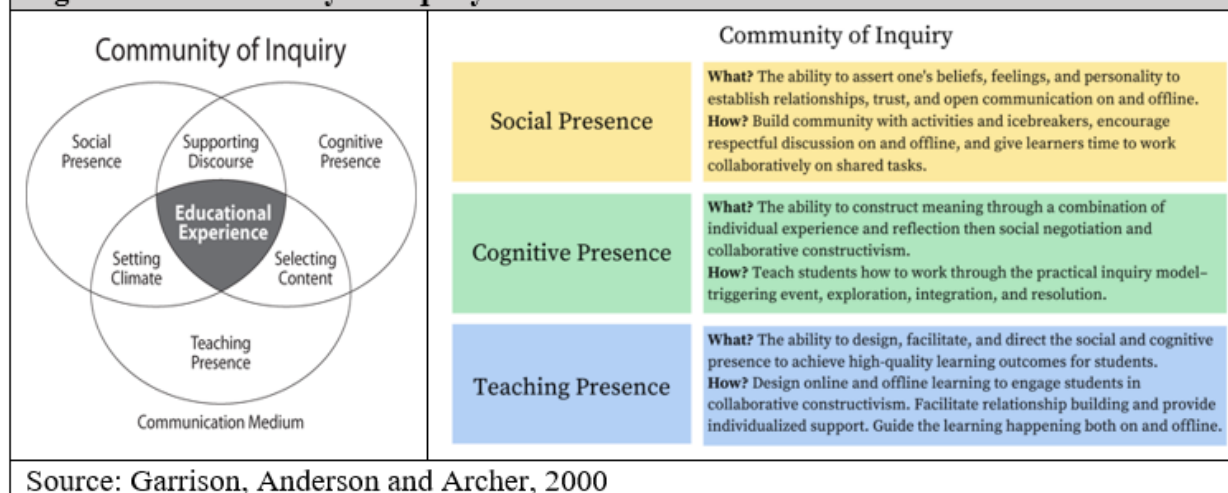
5.2.1 Improve Social Presence in the Learning Environment

Horzum (2017) has mentioned that social presence is an essential variable for Online learning intention. And Oztok (2011) proposed to use the COI Framework (Garrison, Anderson and Archer, 2000) to apply in blended classrooms. So the recommendation was based on the COI Framework to propose three dimensions: Social Presence, cognitive presence and teaching presence.

Learners should be encouraged to identify with the learning community or participate in community activities with other learners, communicate purposefully in an environment of mutual trust, and develop the ability to establish interpersonal relationships by projecting individual personalities. The extent to which learners recognize their existence and construct cognitive presence through continuous reflection and discourse.

Educators can act as intermediaries to incorporate into the teaching process the design of how to increase mental and social circles, provide facilitation and guidance, achieve personally meaningful and educationally valuable learning outcomes, and provide online and offline assistance to learners. In addition, COI advocates that learners can use CMC channels for offline discussions and regular contact after class. Educators may also participate if circumstances permit. Besides, building mutual trust is also very important. Seton (2021) proposed a daily ritual that builds trust and community between students. It can encourage students to open up and learn about those close to them, bringing the entire class together profoundly.

Figure 5.1. Community of Inquiry Framework



5.2.2 Enhance the Learning Experience for Learners by Institutions

In terms of personal experience, both learners and educators can influence learning intention. As long as either party believes that online learning has not stimulated students' interest or lack of participation, it will reduce learning motivation. (Yang and Cornelius, 2004) have mentioned that learners feel lost, frustrated and isolated due to a lack of immediate response or lack of feedback from educators. Due to the lack of two-way interactivity in online learning, learners and educators learn and teach in their environment, which affects the learning experience.

Therefore, Gedera (2014) and Najera (2020) proposed establishing a virtual learning environment (VLE) or virtual classroom to enhance the personal experience of learners and educators. Institutions should use virtual technology to develop a virtual school on the internet and realize a school-running entity that recognises the characteristics and functions of the school without consuming natural educational resources and energy. With the increasing development of the local area network, the global internet has become more popular. The virtual library, virtual laboratory, and virtual campus have also progressed. It enables students to carry out learning in virtual campuses, accompanied by a higher pursuit of cost-effectiveness, which makes teaching and evaluation work based on computer technology have unique advantages and provides prospects for the emergence and development of virtual universities (Ahmad and Minhas, 2021).

Encouraging learners' to participate will create synergies when teachers and learners are taught interactively at VLE. Student feedback and brief self-reflection on the screen produce the best

results in virtual classrooms. Another advantage is the synchronicity of the virtual classroom. For example, this would require learners and educators to "join" the virtual class for this to happen. The virtual platform simulates and realizes the communication between them as if they were talking face to face in the classroom. Collaboration is the key to instantly developing a sense of community in a virtual classroom. Students and teachers can create and edit content together through online tools. Establishing group interactions is important because it facilitates peer knowledge sharing and promotes a sense of belonging among students even when they are not around each other.

5.2.3 Reduce the Digital Divide between Educators and Learners

The digital divide refers to an unequal state of being disadvantaged in the digital environment and contact due to personal environmental factors, thus forming a more disadvantaged phenomenon in education or employment. However, younger learners in higher education are more skilled in applying technology than more youthful or older learners. But that doesn't mean young learners don't have a digital divide. The divide on online education mainly includes two levels. One of them is the bandwidth provided by the internet, whether it can be used by all users smoothly (Hejase, AJ, & Hejase, HJ, 2000). The second is information literacy, whether users can join the network community (Belson, 2020). In terms of the digital divide caused by the epidemic, the impact of student use is even more severe than the gap in hardware.

However, the digital divide can also happen to educators. Tsai (2020) stated that schools could also actively understand the difficulties encountered by teachers in transforming the digital curriculum. Institutions need to know why teachers resist digital transformation. The school committee should assist and need to be co-work with teachers like a partner in teaching, not just supervisors. In addition, to being concerned about students' acquisition of technology tools, software and hardware equipment when conducting online courses, they should further understand the needs of disadvantaged students in the school. For example, family members of underprivileged students may face unemployment due to the epidemic's impact. The impact of family economic conditions on student learning is far more significant than whether students have technological tools in digitizing courses. When teachers conduct online courses, they need to be facilitators, not just indoctrinators of knowledge content. At the same time, when designing lessons, it is also necessary to consider the differences between online courses and physical face-to-face

courses. Teachers must consider increasing teacher-student interaction in online classes and attracting students to study. Enhancing students' intention to learn requires the joint efforts of schools, teachers and parents. After entering the digital learning era, the roles and responsibilities of parents will be more critical than ever. Equivalent to the school classroom, the burden of parents to assist students in learning cannot be transferred.

5.2.4 Defining Intended Learning Outcomes by Institutions and Educators

Many research and educational institutions are concerned with comparing different formats of e-learning, online learning, blended learning or F2F courses to find out which design is most effective in terms of learning outcomes. However, research shows that teaching and learning are complex and not only influenced by instruction. For this reason, the researcher examines many different factors that influence teaching and learning in different formats and other contexts (Nortvig, Petersen and Balle, 2018). The learning and teaching activities of the blended model are more flexible, can cater for the different needs of students, and use a learning management system to maintain regular contact with students and monitor students' learning progress through the system. Educators can flexibly communicate with parents and students by CMC applications to understand students' learning progress and difficulties, provide guidance and emotional support, and allow students to take photos of their homework and submit it through the same method after completing paperwork feedback to students promptly. Implementing blended learning can combine online and offline learning methods to enhance learning and teaching effectiveness.

The epidemic promotes the development of e-learning and serves as an opportunity to change the long-term education model. The mainstream face-to-face classes have been replaced by online courses, which have become online teaching for teachers and offline learning for students. To maximize the benefits of both online and offline education and generate synergistic effects, teachers can better grasp the learning needs of students, narrow learning differences, and promote autonomous learning. The "blended learning" model will be the trend in the academic circle after the resumption of classes. In addition to the advantages of face-to-face classrooms, it can also use technology to conduct e-learning to enhance the effectiveness of learning and teaching. At present, the school is also sharing the experience of practising e-learning and sharing the advantages and disadvantages of various electronic tools through co-workers or class observation so that students can learn in fun and master 21st-century skills.

5.2.5 Reshaping the Hong Kong Virtual University Market

The University Teaching Grants Committee has funded Hong Kong to conduct a virtual university cooperation project as early as 2001. The scheme aims to provide a virtual campus for Hong Kong tertiary institutions. Learners studying or admitted to the relevant institutions can explore the courses offered under the scheme. The planned programme was jointly provided by the Hong Kong University of Science and Technology, City University of Hong Kong, Lingnan University, The Education University of Hong Kong and the University of Hong Kong. The relevant courses covered four areas of general education, information technology, language and science and education (Wikipedia, 2021). Hong Kong academic groups and education departments should encourage universities to reshape the virtual university market and suggest the 4Ps in marketing.

Product - Since not all courses are suitable for online teaching, school sponsors should subdivide which studies are appropriate and what market needs. The results collected by this research questionnaire tend to choose some short-term academic degrees in certificates, diploma or professional diplomas, general education or language courses, etc. Fewer respondents chose long-term studies such as Bachelor's, Master's Degree or postgraduate courses.

Price – Due to the shorter learning time of online courses and less physical school equipment, operating costs can be reduced, allowing institutions to adjust or reduce tuition fees to attract students to choose online courses.

Place - Since the learning environment of the virtual university is carried out on the Internet, learners can study at any time and place. The virtual university is different from the physical campus. The virtual university does not need to occupy the land and quickly expand the business. Virtual universities can also ultimately reduce geographical restrictions and spread worldwide.

Promotion - Under the influence of the epidemic, local physical learning has been changed to online, and it is the best time to promote online education during this period. Since online learning provides a more convenient learning mode, it can significantly enhance learners' learning motivation and interest. Therefore, encourage local education markets or institutions to promote online courses in Hong Kong to other regions

5.3 Limitation and Further Study

The main limitations of this study are the comprehensive discussion of the literature, the selection of factors, the structure of the questionnaire, and the sampling method. The main problem for the extensive literature review is the lack of relevant literature on online learning in Hong Kong, especially in the latest appropriate materials. They only focus on how online learning will affect Hong Kong education after the epidemic outbreak in 2021. Therefore, it takes more time to understand the content of the relevant papers and ensure that it is within the scope of this study. On the contrary, more online learning studies are in overseas regions than Hong Kong. Still, it is necessary to carefully read and select the literature to find similarities to the situation in Hong Kong to support the hypothesis and direction of this research.

Moreover, many factors affect the motivation of online learning. The relevant factor must be carefully verified because the factor may not be suitable for the environment in Hong Kong, and the choice of the element will affect the content of the questionnaire structure. In line with this, we will edit the questionnaire to suit the primary respondents of this study. In addition, the sampling method and the number of people recovered are key factors affecting the data results. Since filling in the questionnaire is conducted online and only takes one month (1st December to 31st December), it is a bit difficult to collect a sufficient number, and the misunderstandings of the respondents cannot be solved immediately. The limitations of this research in higher education are specific requirements for respondents. The number of samples recovered directly affects the accuracy of the results. Due to limited research time and resources, only a "valid sample" of 214 respondents was ultimately collected. Although the sample size is considerable, it is sufficient for the analysis of this study. If the number of samples collected can be increased, it is believed that the survey analysis will be more in-depth and accurate. Under the constraints of time and resources, this research paper can be completed on time.

This study unilaterally interprets the correlation between online learning motivation and outcomes, but various factors affect learners' behaviour patterns and decision-making processes. Academic studies have also analyzed other factors. Therefore, this study suggests that continuing researchers can discuss the methods and results in a two-way comparison to understand further and logically analyze learning motivation and learning outcomes. Let continuing researchers conduct a complete study of how learners' motivation for online learning affects learning outcomes.

Compared to mainstream traditional face-to-face instruction, online teaching in Hong Kong has always been auxiliary. The local online teaching market has been ignored. It wasn't until the outbreak of school closures that schools used messaging software to allow students to teach at home. The teaching mode of teaching workers and whether they can master online teaching software to help improve learners' learning motivation will be the goals of further research. It is hoped that research scholars will conduct further and continuous research on research topics such as the interaction between teaching workers and learners.

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APPENDIX – QUESTIONNAIRE

Survey on Intention Factors of Online Learning on Higher Education in Hong Kong

Master of Business Administration (UWTSD, UK)

Affected by the epidemic, the education industry has ushered in tremendous changes. Online courses have increased significantly. Online learning will become a new trend. Students' intention to choose online learning will be affected by various factors. Therefore, this study explores how multiple factors affect students' online learning motivation.

Anyone 18 years of age or above is our target participant in this survey.

All data will be kept strictly confidential and used for research purposes only. All data will delete after the research is completed. You may withdraw at any time if you wish.

Thank you for your participation.

With the following, The five-point Likert scale response is based on the likelihood range.

Rating 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Please choose the one with the most suitable description. PART1. Demographic Information (Code: DI)

DI1. Gender

- ☐ Male
- ☐ Female

DI2. Age

- 18-20
- 21-29
- 30-39
- 40-49
- 50-59
- 60 or about

DI3. Occupation

- ☐ Student
- ☐ Employees
- ☐ Unemployed

D4. If you are an employee, What is your occupation:

- ☐ Civilian staff
- ☐ Technical staff
- ☐ Operator
- ☐ Professionals Staff
- ☐ Management Staff

DI5. Highest Qualification

- ☐ DSE
- ☐ Certificate / Diploma / Professional Diploma
- ☐ Bachelor Degree
- ☐ Postgraduate or above

DI6. How often do you use a computer?

- ☐ Every day
- ☐ 2-3 times per week
- ☐ Once per week
- ☐ Once per month
- ☐ Less than once a month
- ☐ Never

DI7. Which of the following electronic devices do you own

- ☐ Desktop Computer
- ☐ Laptop Computer
- ☐ Tablet
- ☐ Smartphone

DI8. Do you have any experience in online courses in 2021 or before?

- ☐ Yes
- ☐ No

DI9. If you have the opportunity to take online courses, which of the following course types do you choose?

- ☐ Certificate / Diploma / Professional Diploma
- ☐ Bachelor Degree
- ☐ Master Degree
- ☐ Doctoral

PART2. Survey questions for Social Presence (Code: SP)

SP1. Learners from different social backgrounds participate in the learning together (such as differences in language, age, educational experience), which will affect your learning atmosphere

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

SP2. If an online learning platform can provide (including instant messaging, online discussion, online community functions), it can enhance your online communication opportunities

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

SP3. If the online learning platform can form a learning group or virtual academy, it can improve your online communication opportunities

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

SP4. Are you willing to participate in online discussions or interact with other learners when doing online learning?

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

SP5. Use other Computer-mediated communication (CMC) methods (such as Whatsapp, WeChat, telegram, etc.) to discuss or interact with other learners in the after-class time to enhance your interactivity

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

SP6. When you are studying online or conducting online discussions if you can hide your identity (for example, you don't need to use a camera lens or you only need to discuss in words), can you reduce embarrassment and increase participation?

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

SP7. When you are studying online, can you reduce your privacy concerns if you hide your identity?

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PART3. Survey questions for Personal Experience (Code: PE)

PE1. When you are doing online learning, other learners will feel that there is a lack of learning atmosphere when there is a lack of interaction or participation in discussions

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PE2. For example, an online learning platform can form a learning group or a virtual school, and you will become a part of it, which can enhance your online learning motivation

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PE3. When doing online learning, you will actively interact with other learners or teachers

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PE4. You feel confident using an online learning platform or software without any assistance

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PE5. When you encounter a problem when using computer equipment, you will try to solve it yourself and ask for help.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PE6. You are willing to try to carry out related activities through online learning

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PE7. Online learning can provide a way to learn anytime, anywhere. You can learn in any environment

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PE8. If you can have an independent personal environment for online learning, it will reduce stress and increase participation

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PART4. Survey questions for Learning Outcomes (Code: LO)

LO1. Easy-to-operate e-learning system (LMS) / online learning software (Zoom, Ms Team, Blackboard collaborate) can enhance your learning effectiveness

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

LO2. Proficiency in using e-learning system (LMS) / online learning software (Zoom, Ms Team, Blackboard collaborate) can improve your learning effectiveness

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

LO3. Obtain all learning information through an online learning platform, which can help to achieve learning results

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

LO4. Use online learning to improve or enhance learning efficiency

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

LO5. The school has experience in running online courses, which will enhance your intention to choose online learning

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

LO6. Teachers with online teaching experience will increase your intention to choose online learning

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

LO7. You have used e-learning to achieve your learning outcomes.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

LO8. Using e-learning helped me to improve your Learning performance.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PART5. Survey questions for Digital Divide (Code: DD)

DD1. Your digital capabilities can meet the needs of online learning

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

DD2. You have a habit of using electronic technology products frequently

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

DD3. You have the habit of using the Internet to browse information frequently

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

DD4. If you have broadband Internet access at home, it can provide a stable network to enhance your motivation to choose online learning.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

DD5. Think that using a desktop computer/notebook computer is more convenient than using a smartphone/tablet for online learning

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

DD6. You or your family members have suitable and convenient electronic devices for online learning

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

DD7. Your family members have the skills to use electronic technology products and provide assistance to solve technical problems so that you can reduce the obstacles to learning

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

DD8. If you do not have suitable electronic equipment, your family is willing to lend or buy equipment for you for online learning

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

PART6. Survey questions for Intention (Code: IN)

IN1. You are willing to study in the same environment with people from different social backgrounds

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

IN2. You are willing to use online learning to replace other learning channels

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

IN3. Regardless of the learning effect. You are willing to choose online learning

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

IN4. If you don't feel electronic barriers, you will treat the e-learning course as a learning opportunity

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

IN5. In the future, you will consider choosing online learning courses

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree